BRITISH MEDICAL JOURNAL

LONDON: SATURDAY, JANUARY 25th, 1936

# THE SILICATES OF MAGNESIUM

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Magnesium silicates have long been used in medicine. They are mentioned by Dioscorides[5] in his *Materia Medica*. Some have been prized by geophagists either as table delicacies or as famine foods[2 7 10 11]; steatite or soapstone, a geological variety of talc, has usually been selected for this purpose. Talc is used extensively to-day in dusting powders, and is sometimes given internally in disorders of the stomach and intestines.

There are numerous natural silicates of magnesium. In the present research the field has been narrowed by the exclusion of double salts containing other bases such as calcium. Disilicates, trisilicates, and tetrasilicates have been included, but not the hexa or higher silicates. Naturally occurring forms considered to be magnesium silicate in association with opaline silica have also been omitted.

TABLE I

| | | Atomic Ratio | Hydration |
|---|---|---|---|
| | | Mg Si | |
| 1. Synthetic orthosilicate (Ebelman) ... | $Mg_2SiO_4$ | 2 : 1 | – |
| 2. *Fosterite* (orthosilicate) ... ... ... | $Mg_2SiO_4$ | 2 : 1 | – |
| 3. Natricite (dihydrated orthosilicate) | $Mg_2SiO_4\ 2H_2O$ | 2 : 1 | + |
| 4. *Serpentine* (tetrahydrodisilicate) ... | $Mg_3Si_2O_7\ 2H_2O$ | 3 : 2 | + |
| 5. Gymnite (tetrahydrotriorthosilicate) | $Mg_4Si_3O_{12}\ nH_2O$ | 4 : 3 | + |
| 6. *Enstatite* (Metasilicate) ... ... ... | $MgSiO_3$ | 1 : 1 | – |
| 7. Synthetic hydrated metasilicate (B. von Ammon)[1] | $3MgSiO_3\ 5H_2O$ | 1 : 1 | + |
| 8. Aphrodite ... ... ... ... ... | $Mg_4Si_4O_{12}\ 3H_2O$ | 1 : 1 | + |
| 9. Spadaite ... ... ... ... ... | $Mg_5Si_6O_{17}\ 4H_2O$ | 5 : 6 | + |
| 10. *Talc or Steatite* (dihydrotetrasilicate) | $Mg_3Si_4O_{11}\ H_2O$ | 3 : 4 | + |
| 11. Synthetic hydrated silicate (magsorbent) | $Mg_2Si_3O_8\ nH_2O$ | 2 : 3 | + |
| 12. Synthetic tetrahydrotrisilicate (Döbereiner)[3] | $Mg_2Si_3O_8\ 2H_2O$ | 2 : 3 | + |
| 13. *Meerschaum or Sepiolite* (tetrahydrotrisilicate) | $Mg_2Si_3O_8\ 2H_2O$ | 2 : 3 | + |
| 14. Synthetic hydrated silicate (Lemberg)[12] | $Mg_2Si_5O_{12}\ nH_2O$ | 2 : 5 | + |
| 15. Synthetic hydrated silicate (Heldt)[9] | $MgSi_3O_7\ 2H_2O$ | 1 : 3 | + |
| 16. Synthetic hydrated silicate (Haushofer)[6] | $Mg_2Si_7O_{16}\ 2H_2O$ | 2 : 7 | + |

Many of the analytical problems are still confused by the phenomena of solid solution, the adsorption of other metals, and by the close physico-chemical association of other colloidal compounds of magnesium and silicon themselves. Two non-hydrated silicates exist—fosterite and enstatite—and there is common recognition of three hydrated entities—serpentine, meerschaum, and talc. In addition, there are several other mineral and synthetic hydrated forms of reasonable authenticity. In the accompanying list (Table I), which summarizes the present state of knowledge, the compounds have been arranged in the order of their relative magnesium content. The present investigation deals with the antacid and adsorbent properties of the hydrated varieties.

## Antacid Action

The availability of the magnesium and the rate at which it can be removed by mineral acids varies from compound to compound. A representative series was examined in the following way. All the specimens were ground until they would pass a 350 mesh sieve. They were left in contact with an excess of N/10 hydrochloric acid for a week, and shaken several times daily. The residual acid was then estimated.

The minerals were used in their native form without previous heating or desiccation, and in calculating the results allowance has been made for loss of weight on ignition, and all percentages and weights refer to the anhydrous substances. Specimens were obtained from different localities, the only selection exercised being rejection of those contaminated by large proportions of carbonates. Synthetic silicates were prepared to correspond as closely as possible with No. 11 and No. 14 in the list, and a third one, referred to as 16A, with a somewhat lower magnesium content than Haushofer's variety (No. 16).

A comparison of the figures in columns 4 and 5 of Table II indicates that talc is useless as an antacid, and that even in silicates of the serpentine series only a small fraction of the magnesium is available. At the other end of the scale (No. 16A), not only is the proportion of magnesium in the molecule too low to be of much service in this connexion, but even this small amount is not completely available at concentrations of acid which could be encountered in the digestive tract. The proportion of magnesium available and the total neutralizing power increase substantially in the meerschaum range, and reach their optimum in No. 11, a synthetic silicate corresponding in composition to the theoretical formula of idealized sepiolite or meerschaum. Its superiority to meerschaum itself is possibly due to the inevitable contamination of the latter with other compounds.

The speed of reaction was studied in the case of the pure synthetic compounds alone. In each case there was a rapid initial neutralization followed by a slower process.

TABLE II.—*Antacid Action of the Silicates of Magnesium*

| Silicate | Magnesium Content (Ignited Weight Basis) | | HCl equivalent to Magnesium as Determined by Analysis per gram of mineral (Ignited Weight Basis) | HCl Actually Neutralized by 1 gram of Mineral (Ignited Weight Basis) | Remarks |
|---|---|---|---|---|---|
| | By Analysis | Calculated from Theoretical Formula | | | |
| | per cent. | per cent. | c.cm. N/10 HCl | c.cm. N/10 HCl | |
| Serpentine No. 1 ... | 20.6 | 30 | 169 | 45 | Analysis of Serpentine: Mg Si Al Fe Ca $CO_2$ Ignition loss<br>No. 1 20.7 15.7 1.4 8.3 0.8 0.3 14.3 % |
| ,, No. 2 ... | 21.2 | | 173 | 50 | No. 2 21.2 18.4 2.3 4.4 0.2 0.1 16.2 % |
| Talc No. 1 ... ... | 18.9 | 20 | 155 | 4 | |
| ,, No. 2 (purified) | 19.1 | | 156 | 0 | |
| Meerschaum No. 1 ... | 20.7 | 18.6 | 169 | 81 | Meerschaum No. 1 particularly pure. Total Fe, Al, and Ca = 2.5 % |
| ,, No. 2 ... | 10.2 | | 83 | 93 | No. 2 contained 6 % aluminium, which may have neutralized a proportion of acid |
| Synthetic No. 11 ... | 18.4 | — | 150 | 155 | Calcium and aluminium found up to 1.4 % sufficient to neutralize a proportion of acid |
| ,, No. 14 ... | 14.2 | — | 116 | 116 | |
| ,, No. 16A ... | 6.6 | — | 54 | 32 | With stronger acids—for example, N/1 HCl—the actual neutralizing power equals the calculated |

The extent of initial neutralization varied with the magnesium content of the silicate.

| Silicate | Mg (dry basis) | Vol. N/10 HCl removed by 1 gram (dry basis) in 1 hour at 24° C. |
|---|---|---|
| | per cent. | c.cm. |
| 11 | 17.5 | 142.2 |
| 14 | 14.2 | 77.4 |
| 16A | 6.6 | 26.3 |

Neutralization proceeded more briskly as the strength of the acid was increased.

| Silicate | Vol. of HCl (calculated as N/10) removed during two hours | | |
|---|---|---|---|
| | N/20 | N/10 | N/1 |
| 11 | 139 | 149 | 154 |
| 14 | 93.4 | 105.7 | 115.9 |
| 16A | 34.3 | — | 52 |

At temperatures and acidities approaching physiological values there is a definite speeding up as the temperature rises, but the gradient is not a steep one. At 24° C. 1 gram removed 117 c.cm. N/10 HCl in one hour. At 37° C. 121 c.cm. were removed, and 125 c.cm. at 56°. The lag which occurs in the process of neutralization is well exemplified in Fig. 1, which records the interaction between N/20 HCl (an acidity approximately equivalent to that of gastric juice) and silicate No. 11. A brisk immediate neutralization involved 45 per cent. of the magnesium content of the silicate, leaving 55 per cent. available for later use; 31 per cent. of the base was utilized during the next hour, a further 18 per cent. during the second and third hours. Of the residual 6 per cent. very little remained after twenty-four hours. By the end of a week practically all the magnesium had passed into solution. The washed and ignited residue then contained on analysis 0.54 per cent. of undissolved magnesium. This neutralization lag occurs no matter how finely the substance may be ground. Possibly acid adsorption precedes chemical interaction, or possibly a surface film of silica forms on the silicate particles and hinders further penetration by the acid, or the gel state which the system assumes offers a serious obstacle to diffusion.

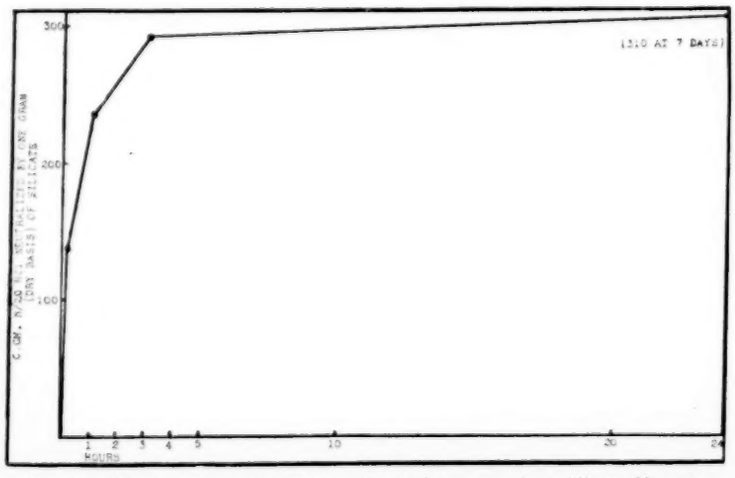


FIG. 1.—Progressive neutralization of acid by magnesium silicate No. 11. (N/20 HCl at 20° C.)

It would appear, therefore, that the hydrated magnesium silicates possess useful antacid qualities which reach their optimum in the synthetic variety, Type 11. In the presence of hydrochloric acid at strengths of clinical interest an immediate substantial antacid action is followed by a slow, progressive neutralization, which continues over a period of many hours.

Within the clinical range the rapidity of this antacid action is regulated (other factors being equal) by the strength of the reacting acid, the bigger demand of a stronger acid being followed by a more rapid utilization of the magnesium content of the silicate.

## Adsorption

Many of the silicates under discussion are adsorbent for various substances in solution. W. Suida[16] found that serpentine could be stained by aniline dyes such as fuchsine and methylene-blue. M. Coplans,[3] working with asbestos (a group of complex magnesium silicates some of which are closely allied to serpentine), demonstrated not only the adsorption of methylene-blue but the removal of a variety of other substances from solution. These included diastase, pepsin, peptone, egg albumen, starch, cobra venom, strychnine, adrenaline, and the toxins of *B. diphtheriae* and *B. tetani*. Wyzard,[18] studying haemolysis, found that asbestos removed both complement and ambo-

ceptor effectively. Coplans's[4] researches extended to meerschaum, which he records as adsorbing the virus from glycerinated calf lymph and becoming activated by the process. Meerschaum adsorbs both basic[17] and acidic dyes, but is nevertheless selective in its affinities—for example, when placed in a mixture of methylene-blue and magenta the mineral becomes blue and the liquid red (H. Michel[13]).

In the present research preliminary experiments were carried out with methylene-blue.

*Method.*—First, 0.2 gram of the powder to be tested was added to 15 c.cm. of an aqueous solution of methylene-blue,

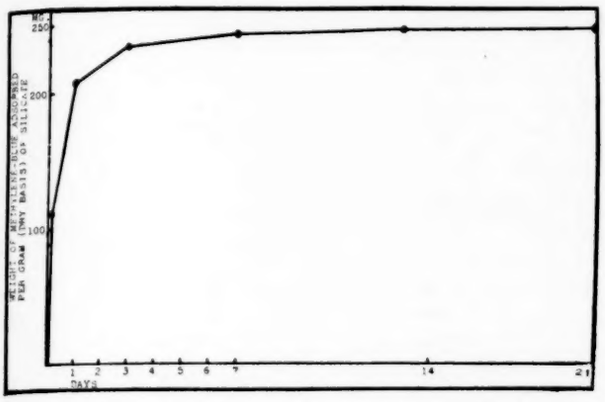


FIG. 2.—Progressive adsorption by magnesium silicate No. 11. (Methylene-blue in distilled water, 20° C.)

and the strength of the residual dye in the supernatant fluid was measured by colorimeter. To obtain steady readings it was necessary to allow the dye and adsorbent to remain in contact, with frequent shaking, for a week. The amount of dye removed by the end of the week was more than double that removed in three hours (Fig. 2). This lag occurred no matter how finely the adsorbent was powdered. The lag also occurred when magnesium silicate was used which had stood under water for a week before the addition of methylene-blue, so that it cannot be explained as due to

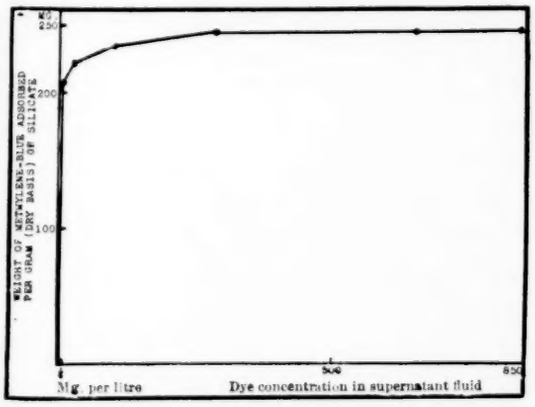


FIG. 3.—Relationship between weight of dye adsorbed and the strength of dye in equilibrium with it in the supernatant fluid. (Methylene-blue in distilled water, 20° C.) Magnesium silicate No. 11.

augmented adsorptive potency induced by progressive hydration of the silicate. Using solutions of dye varying from 0.1 per cent. to 0.3 per cent., it was possible to plot the curve (Fig. 3) showing the relation between the amount of dye adsorbed and the concentration of the dye in equilibrium with it in the supernatant fluid. This is by no means a straight line. It begins as an almost vertical line, then bends steadily, and at last becomes almost horizontal.

For the measurement of the adsorptive potencies of different substances two end-points are available: (1) The clearance value—namely, the amount of dye removed up to the point at which a definite blue tinge is discernible in a given depth of residual fluid. If the standard depth be 2 cm. the blue tint is just discernible at a dilution of one in four million. (2) The maximum weight of dye adsorbed at high concentrations of dye in the supernatant fluid corresponding with the horizontal portion of the curve. With certain substances, such as talc and kaolin, the two values are almost identical, but wide divergence occurs with charcoal and most of the hydrated silicates of magnesium. Using clearance values as the index a number of magnesium silicates were assessed, with the following results (Table III). The kaolin figure is given for

TABLE III.—*Relative Adsorptive Power of Various Magnesium Silicates*

| Silicate | Clearance Adsorption Value for Methylene-blue in Distilled Water at 20° C. |
|---|---|
| | Mg. of dye adsorbed per gram (dry basis) |
| Serpentine No. 1 ... ... ... ... ... | 12 |
| ,, No. 2 ... ... ... ... ... | 9 |
| ,, No. 3 ... ... ... ... ... | 3 |
| ,, No. 4 ... ... ... ... ... | 6 |
| ,, No. 5 ... ... ... ... ... | 3 |
| Talc No. 1 ... ... ... ... ... ... | 3 |
| ,, No. 2 ... ... ... ... ... ... | 3 |
| ,, No. 3 (American) ... ... ... ... | 3 |
| Meerschaum No. 1 ... ... ... ... ... | 38 |
| ,, No. 2 ... ... ... ... ... | 33 |
| ,, No. 3 ... ... ... ... ... | 32 |
| Synthetic magnesium silicate No. 11 ... | 208 |
| ,, ,, ,, No. 14 ... | 99 |
| ,, ,, ,, No. 16A ... | 53 |
| Asbestos ... ... ... ... ... ... | 7 |
| Kaolin (purified "colloidal") ... ... ... | 14 |

purposes of comparison, although kaolin is not a silicate of magnesium. The adsorptive power rose sharply to a maximum in the meerschaum range, the highest value of all being given by the synthetic variety of the same constitutional formula No. 11. All subsequent observations refer to this particular compound, except where the contrary is stated.

Temperature affected adsorption considerably, the maximum amount of dye adsorbable being 42 per cent. greater at 37° than at 20°. The addition of a little alkali up to 0.3 per cent. sodium bicarbonate did not make any appreciable difference, but the addition of a little acid modified the picture substantially. By dissolving the methylene-blue in N/20 hydrochloric acid instead of in distilled water a 40 per cent. improvement was obtained in the maximum adsorptive figure. In the case of synthetic compounds of low magnesium content the phenomenon was reversed. For example, with synthetic silicate 16A, the use of an acid solution of dye reduced the total weight of adsorbed dye by 34 per cent. The interaction is a complex one, the acid being quickly removed by the silicate, after which the system consists not only of water, methylene-blue, and magnesium silicate, but contains, in addition, colloidal silica in suspension and magnesium chloride in solution.

Quantitative data alone do not give any true indication of the relative adsorptive powers of different substances. It is necessary to know their qualitative range. This problem was investigated in relation to dyes, alkaloids, toxins, ferments, and various other substances.

### Qualitative Range in Relation to Dyes

In quasi-scientific medical literature the terms "colloid," and "crystalloid," "acidic" and "basic" are applied to dyes with a facility which implies that they represent easily defined and sharply differentiated qualities. Such assumptions are unwarranted. If the ability to pass through a standard dialysing parchment membrane be taken as a test of a crystalloid, at least three groupings are needed—into crystalloid, semicolloids, and colloids.

A representative series of dyes of exceptional purity was obtained through the courtesy of Professor C. S. Gibson. Solutions of 0.1 per cent. of each in distilled water were placed in parchment dialysing tubes suspended in distilled water, and observed after half an hour and twenty-four hours respectively. Rapid tinting of the water outside indicated a crystalloid dye; absence of tinting a colloid. Where diffusion was not perceptible at the end of half an hour, but obvious at twenty-four hours, the dye was given an intermediate classification of "semicolloid." No attempt was made to discriminate between pure crystalloids and those which were mostly crystalloid but also contained a small colloid element.

Basicity was determined from the constitutional formula, each acidic and basic group being given equal significance. With acidic dyes it is usual to satisfy the $SO_3$ side chain with sodium, and employ the sodium salt instead of the primitive substance. This applies to all dyes examined in the present research. After satisfaction of the $SO_3$ groups, the balance of the residual groups may be basic or acidic. For classification, therefore, the dyes have been divided into basic dyes and the sodium salts of acidic dyes, the latter group being subdivided into those with residual acidic and those with residual basic preponderance. The dyes were further grouped in accordance with their general chemical nature.

In measuring the adsorbent power of the silicate for these various dyes, 0.2 gram of the powder was added to 12 c.cm. of a 0.1 per cent. solution of the dye in distilled water, and comparison was made between the colour of the original solution, that of the supernatant fluid, and that of the magnesium silicate. Different adsorptive affinities were exhibited for different dyes, and the potency of the silicate in respect of each was recorded numerically on the following basis.

| | Adsorptive Potency |
|---|---|
| Supernatant fluid unchanged in colour ... ... | zero |
| Slight loss of colour (just perceptible) ... ... | 1 |
| Substantial loss of colour but still well tinted ... | 2 |
| Slight tinge of colour remains (just perceptible) ... | 3 |
| Colourless (all dye removed) ... ... ... ... | 4 |

The various data are incorporated in Table IV.

It is clear that the magnesium silicate in question adsorbs a great variety of dyes of widely differing chemical nature. It shows a strong preference for basic dyes. In fact, all basic dyes examined were adsorbed readily and flocculated the silicate. The acidic dyes, however, were not rejected completely. In certain cases they were adsorbed to a substantial extent—for example, acid green, Congo red, naphthol yellow, quinoline yellow covering four different chemical groups; crystalloid, colloid, and "mostly colloid" substances; and examples of acidic dyes with residual acid preponderance as well as others with residual basic preponderance.

The preference of magnesium silicate for basic dyes is seen significantly in the case of dyes chemically akin but of opposite reaction; for example, in the triphenylmethane series each of the five basic dyes was adsorbed freely, but only one of the four acidic members of the same group. The acidic and basic derivatives of fuchsine furnish a particularly convincing example. This decided physical affinity for basic dyes is in remarkable contrast with the strong chemical affinity of the silicates for acids as discussed in the section on antacid properties.

TABLE IV.—*Aniline Dyes*

(Adsorption by Magnesium Silicate No. 11)

| Dye | Chemical Group | General Group | | | Physical State | | | Adsorptive Potency |
|---|---|---|---|---|---|---|---|---|
| | | Basic | Acidic | Residual Preponderance of Sodium Salt | Crystalloid | Colloid | Semicolloid | Magnesium Silicate (11) |
| Methylene-blue ... ... | Thiazine | B | | | + | | | 4 |
| Safronine ... ... ... | Azine | B | | | + | | | 3 |
| Indine blue ... ... | Oxazine | B | | | + | | | 4 |
| Auramine O ... ... | Diphenylmethane | B | | | + | | | 4 |
| Brilliant green ... ... | | B | | | + | | | 4 |
| Malachite green ... | | B | | | + | | | 4 |
| Victoria blue ... ... | | B | | | | + | | 4 |
| Methyl violet ... ... | | B | | | + | | | 3 |
| Basic fuchsine ... ... | Triphenylmethane | B | | | + | | | 3 |
| Acid fuchsine (magenta) | | | A | B | | | + | 1 |
| Acid green G ... ... | | | A | B | | | + | 2 |
| Disulphine blue ... | | | A | A | + | | | 1 |
| Fast acid violet 103 ... | | | A | B | + | | | 4 |
| Chrysoidin ... ... | Azo | B | | | + | | | 3 |
| Aminoazo-benzene monosulphonate | Monazo | | A | A | + | | | 1 |
| Carmioisin W. S. ... | | | A | A | + | | | 1 |
| Chlorazol sky blue FF | Primary diazo | | A | B | | + | | 1 |
| Black G. W. ... ... | | | A | A | | | + | 1 |
| Coomassie navy blue 2 R.N. | Secondary diazo | | A | A | | + | | 1 |
| Congo red ... ... ... | Tetrazo | | A | B | | + | | 2 |
| Naphthol yellow ... | Nitro | | A | A | + | | | 2 |
| Eosine ... ... ... | Phthalein | | A | | + | | | 1 |
| Mercurochrome ... | | B | | | + | | | 2 |
| Quinoline yellow ... | Quinoline | | A | A | + | | | 2 |
| Indigo carmine ... ... | Indigotin | | A | A | + | | | 1 |

### Alkaloids

Many alkaloids are removed from solution by magnesium silicate No. 11. Distilled water left in contact with the silicate acquires a *p*H of about 8.5—that is, slightly on the alkaline side of the neutral point. Brucine was used in determining whether the removal of alkaloids was due to simple precipitation of the liberated base or to adsorption. The base brucine is soluble 1 in 320 parts of cold water. A solution of 0.1 per cent. of the hydrochloride was used containing less than 1 part of the base in 1,000 parts of water. The addition of sodium carbonate to such a solution did not cause precipitation of the base, even after the solution had been heated and recooled.

It was also noted that distilled water left in contact with the silicate for a week, and then cleared, dissolved brucine hydrochloride readily and without subsequent precipitation. The silicate removed brucine from this 0.1 per cent. solution of the hydrochloride to the extent of 32 mg. per gram. The supernatant fluid no longer reacted to Wagner's test for brucine, sensitive to 1 in 500,000, or to Mayer's test, sensitive to 7 in 30,000. The

alkaloid was easily recovered by decomposition of the silicate with hydrochloric acid. Even with less soluble bases the issue was quite clear between adsorption and precipitation of free base. For example, solutions of strychnine hydrochloride were easily freed from alkaloid by the silicate to the extent of securing negative Mayer and Wagner reactions in the supernatant fluid. If, however, the free base was simply precipitated by the addition of caustic soda, the filtrate still contained sufficient alkaloid to give positive reactions with these reagents.

Table V shows the extent to which the various alkaloids were removed from 0.1 per cent. aqueous solutions. Various weighed amounts of the silicate were added to 10 c.cm. of a 0.1 per cent. solution of the

TABLE V.—*Alkaloids*

[Adsorption by Magnesium Silicate No. 11 from Aqueous Solutions at 20° C. (Clearance Values)]

| Alkaloid | Weight of Alkaloidal Salt removed by 1 gram Ignited Weight of Silicate |
|---|---|
| | mg. |
| Muscarine ... ... ... ... ... ... | 53 |
| Brucine hydrochloride ... ... ... ... | 32 |
| Solanine ... ... ... ... ... ... | 30 |
| Papaverine hydrochloride ... ... ... | 28 |
| Strychnine hydrochloride ... ... ... | 27 |
| Apomorphine hydrochloride ... ... ... | 23 |
| Atropine sulphate ... ... ... ... ... | 26 |
| Colchinine salicylate ... ... ... ... | 15 |
| Emetine hydrochloride ... ... ... ... | 14 |
| Nicotine ... ... ... ... ... ... | 14 |
| Codeine phosphate ... ... ... ... | 13 |
| Dionine hydrochloride ... ... ... ... | 13 |
| Cocaine hydrochloride ... ... ... ... | 12 |
| Morphine hydrochloride ... ... ... | 11 |
| Pilocarpine nitrate ... ... ... ... | 8 |
| Veratrine ... ... ... ... ... ... | 6 |

respective alkaloidal salts until an amount was found which freed the solution from the alkaloid in one hour at room temperature. The figures, therefore, are clearance figures. By analogy with methylene-blue, it is to be expected that when fully saturated the silicate would hold far more than these amounts. In the cases of solanine and muscarine the chemical tests were confirmed biologically, an amount of fluid originally containing 10 lethal doses (frog) being entirely innocuous to that animal after treatment with the silicate. A selective affinity for certain alkaloids is discernible. As in the case of the dyes, this is not governed by any obvious chemical kinship between the alkaloids concerned.

*Putrefactive Amines.*—Histamine was removed from an aqueous solution of the acid phosphate to the extent of a little over 9 mg. per gram of silicate, and tyramine to a slightly less extent.

## Colloids

The silicate interacted with many colloids, but did not discriminate sharply between electro-negative and electro-positive varieties. It did not seem feasible to differentiate mutual flocculation from true adsorption. Colloidal ferric hydroxide was taken as an example of positively charged colloid. The solution was rapidly decolorized by the silicate. After acidification the supernatant fluid no longer gave the Prussian blue reaction, but the silicate responded positively to the same test. As observed under the microscope, all the particles took on the blue colour evenly. Colloidal arsenious oxide was selected as a negatively charged colloid ; its colour was quickly removed by the silicate. Kaolin and hydrated aluminium hydroxide were tested in parallel for comparison. Each decolorized the iron solution, but left the arsenic unaffected.

The adsorption of colloidal dyes has already been mentioned. Many other colloids—for example, starch, whey protein, acid albumen and alkali albumen prepared from egg-white, were also removed from solution. The silicate afterwards gave positive reactions and the supernatant fluid negative ones when tested appropriately with iodine or the biuret reagent. The proteoses described by Oriel in the urine of allergic subjects were also adsorbed. The study of the digestive ferments in relation to the silicates was complicated by considerations of hydrion concentration, and will be dealt with in a later paper.

## Toxins

Two very toxic colloids can, however, be discussed here—namely, tetanus toxin, and the toxin of *Amanita phalloïdes*, which is responsible for most of the deaths following the ingestion of poisonous fungi.

*Tetanus Toxin.*—An aqueous solution of dry toxin was made to the approximate strength of 1 M.L.D. (20 gram mouse) per 0.1 c.cm., and injected into a series of mice in graduated doses with fatal results (see Table VI). Then 10 c.cm. of the solution were treated with 0.5 gram

TABLE VI.—*Tetanus Toxin*

(Detoxication of Solutions by Magnesium Silicate No. 11)

| Mouse | Weight | Injection into Right Flank | Result | | |
|---|---|---|---|---|---|
| | | | 3rd day | 5th day | 7th day |
| A | Grams 25 | Toxin solution 0.1 c.cm. | Severe spasm right hind leg | Very ill | Recovering: spasm still noticeable |
| B | 29 | 0.2 c.cm. | ,, | Dead | — |
| C | 34 | 0.4 c.cm. | ,, | Dead | — |
| | | Toxin solution after magnesium silicate No. 11 | | | |
| D | 27 | 0.1 c.cm. | Normal | Normal | Normal |
| E | 26 | 0.2 c.cm. | ,, | ,, | ,, |
| F | 30 | 0.4 c.cm. | ,, | ,, | ,, |

of magnesium silicate No. 11 and filtered. The filtrate was injected into a second series of mice without causing any disturbance, even when an amount originally containing three times the minimum lethal dose was administered. It follows that 1 gram of the silicate removed at least 140 M.L.D. (mouse units) of tetanus toxin.

*Amanita phalloïdes Toxin.*[15]—A sterile concentrate of the toxin, very kindly supplied by Professor R. Dujarric de la Rivière, was tested for toxicity by intraperitoneal injection into mice. Two portions were treated with the silicate in the proportion of 1 and 3 grams respectively of the silicate to 5 c.cm. of the toxin concentrate. After filtration they were injected intraperitoneally with uniformly fatal results (see Table VII).

The magnesium silicate is clearly selective in its affinities. It removes tetanus toxin freely from solution, but is without influence over the toxin of *Amanita phalloïdes*.

One final example of a toxic substance of clinical importance is furnished by a crystalloid mussel poison.[14] A specimen of this most deadly of all known poisons was obtained through the kindness of Dr. Hermann Sommer

TABLE VII.—*Amanita Phalloïdes Toxin*

(Dujarric de la Rivière)

| Mouse | Weight | Intraperitoneal Injection | Result |
|---|---|---|---|
| | Grams | Original solution | |
| A | 20 | 1 c.cm. | Survived about 2 hours, and then died |
| B | 23 | 1 c.cm. | Died in 50 minutes |
| C | 21 | 2 c.cm. | ,, 25 ,, |
| D | 25 | 3 c.cm. | ,, 15 ,, |
| E | 29 | 4 c.cm. | ,, 25 ,, |
| | | Toxin solution after treatment with magnesium silicate No. 11 1 gram per 5 c.cm. (Free from soluble magnesium salts) | |
| F | 24 | 2.5 c.cm. | Died in 42 minutes |
| | | Toxin solution after magnesium silicate No. 11 3 grams per 5 c.cm. | |
| G | 27 | 0.8 c.cm. | Survived |
| H | 23 | 1 c.cm. | Died in 55 minutes |

of California University. A standard solution was made in water, and the minimum lethal dose was measured by intraperitoneal injection into 20-gram mice. Doses ranging from 0.01 to 1 c.cm. were used with rapidly fatal results to each of twenty-five mice, which received doses of 0.04 c.cm. or more. The solution was treated with varying weights of the silicate for one hour, filtered, and injected in amounts corresponding to 5, 12.5, and 25 lethal doses respectively. These mice did not suffer any ill effects until the amount of silicate used to clear 10 c.cm. of the mussel poison solution was reduced to less than 1 gram.

Alkalis destroy the poison, but at *p*H 8.8 Hellmut Müller was unable to detect any loss of potency in twenty-four hours. The alkalinity of distilled water in contact with silicate No. 11 only corresponds to *p*H 8.5, and the experiment was completed within three hours, so that the disappearance of the poison cannot be attributed to change in reaction. The details are given in Table VIII,

TABLE VIII.—*Mussel Poison*

(Detoxication of Solution by Magnesium Silicate No. 11)

| Weight of Magnesium Silicate No. 11 (Ignited Basis) used to clear 10 c.cm. Mussel-Poison Solution (M.L.D. = 0.04 c.cm.) | Mouse | Intraperitoneal Injection | Original Toxic Content of Liquid Injected | Result |
|---|---|---|---|---|
| Grams | | c.cm. | M.L.D. | |
| 5.8 | 1 | 0.2 | 5 | No effect |
| | 2 | 0.5 | 12.5 | ,, |
| | 3 | 1.0 | 25 | ,, |
| 3.6 | 4 | 0.2 | 5 | ,, |
| | 5 | 0.5 | 12.5 | ,, |
| | 6 | 1.0 | 25 | ,, |
| 2.2 | 7 | 1.0 | 25 | ,, |
| 0.7 | 8 | 0.2 | 5 | |
| | 9 | 1.0 | 25 | Died in 30 minutes |

NOTE:—Mice injected with 0.04 c.cm. of the original solution died in 5 to 20 minutes; with 0.05 c.cm. they all died in less than 5 minutes.

from which it can be calculated that 1 gram of the silicate adsorbs 343 M.L.D. of mussel poison, or that less than 1/20 grain of the silicate is required to neutralize one fatal mouse dose of mussel poison.

It is interesting to note that the residue left after the removal of all the magnesium from the silicate by interaction with an excess of N/10 HCl still removes mussel poison to the extent of 96 M.L.D. per gram of residue (ignited basis).

## Summary

The conclusions reached in this paper may be summarized as follows.

ACID NEUTRALIZATION

1. Certain hydrated silicates of magnesium possess strong antacid properties.

2. The power of neutralizing weak acids attains its maximum in the trisilicates.

3. The initial phases of the reaction are quick, but several hours are required for the completion.

4. Within the clinical range of acidities neutralization proceeds more quickly at high acidities than at low ones.

ADSORPTION

1. Synthetic hydrated trisilicate of magnesium exhibits powerful adsorbent qualities. At the saturation point for methylene-blue it is seventeen times as active as colloidal kaolin (room temperature), and at body temperature the disparity is even greater.

2. Its immediate adsorptive activity is considerable, but several days are required for saturation.

3. The range of its adsorptive affinities covers a great variety of substances, including acid and basic dyes, alkaloids, bacterial toxins, putrefactive amines, and food poisons.

4. Adsorption is selective, and a decided preferential affinity was noted for basic dyes—both crystalloid and colloid. It did not adsorb the poison of *Amanita phalloïdes* ("mushroom" poison), but readily removed muscarine ("mushroom" poison) and Müller's mussel poison from aqueous solution.

REFERENCES

[1] Ammon, B. von: *Ueber einige Silikate der Alkalein und Erden*, Köln, 1862.
[2] Altheer, J. J.: *Natuurkundig Tijdschrift voor Nederlandsch Indie*, Batavia, 1857, xiii, 83.
[3] Coplans, M.: *British Medical Journal*, 1913, ii, 1360, 1375.
[4] Idem: *Journ. Trop. Med. and Hyg.*, May, 1926.
[5] Dioscorides: *Materia Medica*, v, 161.
[6] Döbereiner, J. W.: *Gel Anz München*, 1839, p. 157.
[7] Fauvel, A. A.: *La Province Chinoise du Chantoung* (Brussels, 1892), p. 163.
[8] Haushofer, K.: *Journ. Prakt. Chem.*, 1866, p. 241.
[9] Heldt, W.: Ibid., 1865, p. 157.
[10] Hooper, D., and Mann, H. H.: *Memoirs of Asiatic Society of Bengal*, 1906, i, 259.
[11] Labillardière: *Voyage in Search of La Pérouse*, 1790, ii, 213.
[12] Lemberg, J.: *Zeit. Deut. Geol. Ges.*, 1876, p. 563.
[13] Michel, H.: *Tschermak's Mitt.*, 1905, p. 430.
[14] Müller, H.: *Journ. Pharm. and Exp. Therap.*, 1935, p. 67.
[15] Rivière, R. Dujarric de la: *Le Poison des Amanites Mortelles*, 1933.
[16] Suida, W.: *Sitzber. Akad. Wien*, 1909, p. 725.
[17] Idem.: Ibid., 1904, p. 736.
[18] Wyzard, S.: *Journ. Path. and Bact.*, 1914, p. 581.

G. L. Moench (*Amer. Journ. Surg.*, November, 1935, p. 310) considers that dilaudid (dihydromorphinone hydrochloride) in proper dosage is an adequate substitute for morphine in gynaecological operations. He finds it about three times as strong as morphine in its narcotizing effect, and perhaps five times as strong in analgesic action. With some types of patient this lack of soporific effect may be detrimental. It inhibits intestinal peristalsis much less than does morphine, and in perineal cases Moench found that the patients were able to empty the bladder voluntarily sooner after dilaudid administration. Except in difficult operations all the women who had had dilaudid had less vomiting and distension, complained less of "gas," and had a softer and flatter abdomen than was the case with women in a control series who had been given morphine. The author satisfied himself that minimum intra-abdominal manipulation and the pre-operative administration of dilaudid will best avoid abdominal distension, but in pelvic inflammation this drug seemed to have no advantage over morphine. Dilaudid does not produce euphoria as does morphine, and the danger of addiction is not so great.

# RELATION OF THE OVARIAN CYCLE TO ENDOCRINOLOGY*

BY

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Opening this discussion I shall confine myself to that part of the ovarian cycle which is under the influence of the corpus luteum. I hope, however, that other speakers will fully discuss the role of the anterior pituitary gland and of the follicle system in the ovaries.

The material which I have at my disposal consists of eight specimens of corpora lutea from the menstrual cycle and from pregnancy; some of these are accompanied by the corresponding uterine mucosa. Some of the specimens have been illustrated in an article published in the *Irish Journal of Medical Science* (January, 1933). In this paper an effort was made to elucidate the significance of haemorrhage in the human corpus luteum.

At the meeting of the British Medical Association in Dublin in 1933 Professor Novak stated that Hartman's views with regard to an active substance derived from the anterior pituitary gland as a cause of the onset of menstrual bleeding had been abandoned. I had endeavoured to show that in the human corpus luteum the onset of haemorrhage in the uterine mucosa was accompanied by a synchronous haemorrhage in the corpus luteum. This, to my mind, explained the very rapid degeneration of the corpus luteum of menstruation. On the other hand, in the corpora lutea of pregnancy that I had had the opportunity of examining I had never been able to demonstrate gross bleeding. Novak did not agree with my interpretation of the series that I had collected. However, he thought that further investigation might do something towards elucidating the problem.

There is no doubt that haemorrhage occurs in the corpus luteum at various stages of its history, and this fact makes it very difficult to state that a haemorrhage seen at the time of the onset of menstruation can be attributed to any specific cause. The one conclusion in my study of the past two years is that no corpus luteum from pregnancy has shown the presence of bleeding.

## First Specimen

No. 7749, iii, 20; examined July 19th, 1932. In an unmarried patient, aged 18, menstruation had been irregular, but as a rule there was a twenty-eight-day interval. She had pain in the left side, but the uterus was normal in position. Laparotomy was performed on August 3rd (fourteenth day of cycle), when a retrocaecal appendix was found showing signs of recent inflammation. Appendicectomy was performed, and the corpus luteum was resected from the left ovary. Bleeding or menstruation occurred within forty-eight hours of the operation.

Macroscopically the section through the meridian of the corpus luteum showed a very definite stigma. The measurements after fixation were 2 cm. by 0.9 cm. The history and the appearance of the corpus luteum suggested that ovulation had preceded the operation by a comparatively short period, possibly two days or less.

Apparently a resected corpus luteum separates from the ovarian tissue, carrying with it both the theca externa and the theca interna. This was certainly the case in this specimen and in other corpora lutea that I have resected.

A photomicrograph (× 7) depicted the general characteristics. At this magnification the main features recognized were: (1) A central cavity occupied by a clear coagulum at the pole further from the stigma. A collection of extravasated blood occupied that part of the cavity near the stigma. Although this blood extravasation was most marked at this part of the cavity small quantities were present contiguous with the inner limits of the luteal cells. (2) The luteal tissue was not markedly folded, and thus varied greatly in depth. Its inner margin was somewhat irregular, a feature more easily recognized at the higher magnification.

Under a high magnification further features were revealed. The cells of the theca interna were easily distinguished lying in irregular wedge-shaped masses among the luteal cells, which were larger and showed varying degrees of vacuolation. Tracing the theca interna cells towards the centre of the corpus luteum it became increasingly difficult to identify them. The luteal tissue was vascularized to a great degree, but not completely. Where the luteal cells were contiguous with the central cavity there was at some places no connective tissue limiting their border. In the main, however, there was a definite layer of loosely arranged connective tissue cells bordering the internal surface of the luteal cells and separating it from the central cavity.

A remarkable feature of these cells was their arrangement into centripetal strands, especially where they were in contact with the blood extravasation. In the cytoplasm of such cells small granules of blood pigment were seen.

*Summary.*—This was a very young corpus luteum, as instanced by the incomplete development of its fibrous and vascular structure. The degree of vacuolation in the luteal cells suggested an already active function. The extravasated blood was in all probability derived from the vessels broken at ovulation, but the distribution of the blood around the margin of the central cavity was possibly the result of haemorrhage arising from the vessels of the theca interna. Williams regards this latter source as the most important; Novak, however, does not confirm Williams's opinion.

## Second Specimen

This was also a comparatively young corpus luteum, taken out on the thirteenth day of the menstrual cycle, but in this case the cycle was only twenty-one days. It showed many characteristics of the previous specimen, but appeared to be more fully formed, and might be regarded as being four days after the date of ovulation. The distribution of bleeding was very wide. This type of haemorrhagic corpus luteum is responsible for the difficulty in making an estimate of the significance of the haemorrhage in the corpus luteum.

## Third Specimen

No. 100, iii, 42; examined April 29th, 1932. In an unmarried woman, aged 34, menstruation was regular, with a periodicity of twenty-eight days. She had pain in the back, and there was retroversion of the uterus. Appendicectomy was performed on May 9th, 1932, the twenty-seventh day of the cycle (Gilliam suspension; corpus luteum resected). The specimen was fixed in Da Fano's solution. The measurements of an approximately meridian section, after fixation, were 1.8 cm. by 1.2 cm. The removal of this corpus was followed by the onset of menstrual bleeding on the following day.

A photomicrograph (× 7) depicted the general characteristics of this specimen. The main features to be recognized were: (1) a central cavity occupied by a clear coagulum, in the midst of which was a curious tongue of luteal tissue which was really contiguous with the rest of the luteal cells, but projected into the cavity in a remarkable fashion; (2) a fairly even layer of luteal

* Read in opening a discussion in the Section of Obstetrics and Gynaecology at the Annual Meeting of the British Medical Association, Melbourne, 1935.

tissue, averaging about 2 mm. in depth and presenting a moderately folded appearance, seen especially at the lower pole ; (3) the connective tissue strands among the luteal cells and bordering their internal limits was well marked. This layer, dividing the luteal cells, showed up as a dark line, owing to the deep staining of the connective tissue cells, and the presence of a moderate amount of red blood cells which were possibly already extravasated.

High-power magnification revealed a very definite differentiation of the theca externa from the theca interna. The former was congested and vascular. The cells of the latter were well shown by virtue of their argentophil tendencies, and were seen distributed among the luteal cells. The luteal cells were vacuolated, but not to such a marked degree as in the specimen just described.

*Summary.*—In this corpus luteum there was no gross haemorrhage, although scattered through the cavity there were small collections of red blood cells. The luteal cells were well differentiated from the theca interna cells by the nature of the fixation. The connective tissue was well developed in contrast with the first specimen described. In the connective tissues there was congestion or a very moderate extravasation of blood.

### Fourth Specimen

No. 7603, iii, 93 ; examined June 8th, 1932. A five-para, aged 39, menstruated with irregular periodicity, the intervals varying between twenty-six and thirty-one days. There was a prolapsed uterus, which was enlarged and retroverted. Abdominal hysterectomy was performed on June 9th, the twenty-fifth day of the cycle.

The specimen is described after the previous one, although the actual age in days is possibly younger, because the uterine mucosa showed an immediately premenstrual condition, as regards commencing blood extravasation in the stroma, the gland picture, and the appearance of the individual cells of the stroma.

I do not take this specimen in itself as very good evidence of the appearance of the corpus luteum just before the onset of menstruation, but I have another specimen, obtained on the thirtieth day of the cycle (menstruation had not yet occurred), whose appearance is very similar. The histology, however, of this specimen is very striking, and the reader can criticize the conclusions since all the facts are before him, including the important evidence that a bimanual examination was made twenty-four hours before operation.

The specimen measured 1.7 cm. by 1.4 cm. after fixation. In the photomicrograph (× 7) of this specimen could be seen a central cavity occupied by a clear coagulum. The luteal tissue was somewhat more folded than in the previous specimens, and its average depth was greater—up to 4 mm. The most obvious feature in the photograph was the amount of congestion in the vessels, not only of the theca externa, but of the capillaries in the luteal tissue and in the connective tissue between the luteal tissue and the central cavity. This condition of congestion compared most interestingly with the endometrium.

Again, in this specimen the theca interna and theca externa were easily distinguishable, the cells of the latter forming characteristic wedge-shaped masses between the folds of the luteal cells. The whole structure was very well vascularized ; it had a complete stroma of connective tissue, which included a well-defined layer between the luteal tissue and the central cavity.

*Summary.*—This corpus luteum, which I conclude had been removed just before the onset of menstrual bleeding, showed very marked congestion and commencing haemorrhage in the area between the luteal cells and the central cavity, but as yet the blood had not burst its way into the central cavity to any marked extent. The number of luteal cells, or rather the mass of luteal tissue, appeared greater than in the previous specimens, but vacuolation of the cells was less marked than in the first specimen described.

I have, in addition to the corpus luteum, the mucous membrane of the uterus, which was typically premenstrual, with regard to both the gland picture and the capillary dilatation. This showed very well the relation between the active corpus luteum and the secreting endometrium.

### Fifth Specimen

No. 7450, iii, 11 ; examined March 31st, 1932. A three-para, aged 39, who had been married for ten years, had had her last pregnancy in 1926. Her menstrual periodicity was twenty-eight days. An abdominal tumour reached to the ensiform process. Total hysterectomy was performed on April 4th. The tumour, though very large, was intraligamentary ; it had not distorted the uterine cavity, and there had been no disturbance of the menstrual cycle. The menstrual flow started the evening before the operation ; thus the operation was undertaken in the first twenty-four hours after the onset of the menstrual flow.

The uterine mucosa presented the following features. The surface epithelium was in most places intact, but there were many areas where it had become ragged and stripped. There was a well-marked compact layer of stroma wherein the individual cells were large, but there was remarkably little blood, either extravasated or in the nature of congestion. The glands presented a collapsed condition, as did the whole mucosa in comparison with the mucosa in the previously described specimen. The corpus luteum measurements of an approximately meridian section after fixation were 1.4 cm. by 1.2 cm.

The photomicrograph (× 7) showed the general characteristics of the specimen. The central cavity was filled to a large extent with clear coagulum, while at the deeper end of the structure the cavity was occupied by a good deal of extravasated blood, which formed a fairly even layer around the margins of the central cavity. Its position as regards the connective tissue which separated the luteal cells from the central cavity was very definite. It lay in the cavity of the corpus luteum. The luteal cells were not well stained, and were smaller than in the previous specimens. There was a good deal of vacuolation of the luteal cells. There was no congestion of the capillaries between the luteal cells, but the vessels in the theca externa were dilated. The staining of the whole section was much less intensive than in the case of the previous specimen.

*Summary.*—This corpus luteum, removed on the first day of menstruation, showed an extravasation of blood into the central cavity which was not limited to any part of the periphery of the cavity. The luteal tissue was not well stained, and was anaemic. The theca externa and theca interna were both well preserved ; the cells of the latter were well stained, and showed up remarkably in contrast with the luteal cells. The depth of the luteal tissue was less than in the previous specimen.

### Sixth Specimen

This specimen (No. 99) was described in the account of an early ovum in the *Journal of Obstetrics and Gynaecology of the British Empire* (vol. xxxix, No. 3). It was resected on the fifth day after a missed period, and was fixed in picroformol. Its measurements were 1.2 cm. by 0.7 cm. The depth of the luteal tissue was very even, and measured 4 mm.

A photomicrograph (× 7) showed a rather collapsed central cavity with no gross haemorrhage in it, but more connective tissue than in any of the previous specimens. The border of connective tissue between the luteal cells

and the central cavity was well defined. The luteal cells were well stained, and the vascular channels were shown up by the deep staining of their walls, although there was no congestion. There was much vacuolation. The theca interna cells were beautifully differentiated, while the theca externa was well marked and vascular.

*Summary.*—This corpus luteum showed no gross haemorrhage in the central cavity, although small collections of blood cells could be recognized. The central core was markedly fibrous, and the general appearance of the luteal tissue suggested continued activity.

### Seventh Specimen

This corpus luteum (No. R 1) was removed in the course of a hysterectomy during pregnancy in a case of multiple fibroids, the size and position of which precluded continuance of pregnancy or a conservative operation. The patient was suffering from acute intestinal obstruction due to impaction at the time of operation. (I am indebted to the Master of the Rotunda Hospital for the opportunity of describing this specimen.) Pregnancy had lasted eighty-four days since the last period, so the age of the corpus luteum may be calculated as about seventy days. It was fixed in formalin, and the section measured 2 cm. by 0.7 c.cm.

Magnified by seven diameters, the picture showed the general structure very well. The central cavity was occupied by firm fibrous tissue ; it had collapsed since fixation, and apparently contained a cystic centre. There was no trace of haemorrhage in this specimen. The luteal cells stained well, and vacuolation was well marked. The endothelial walls of the capillaries in the luteal tissue were also well stained, and there was no congestion. The theca interna cells were well differentiated, while the theca externa was very definite, and showed up as a well-stained and vascular area.

*Summary.*—This corpus luteum showed no haemorrhage either macroscopically or microscopically. The luteal tissue was bulky and well vascularized. The connective tissue was more fully developed than in any of the previous specimens, and all the constituent cells were well differentiated. Comparing it with the previously described corpus luteum of pregnancy it was larger, and its individual luteal cells were not so well stained.

### Eighth Specimen

This specimen was from a pregnancy which had lasted ten weeks, and was terminated owing to the patient's general condition. In this case the corpus luteum again showed no haemorrhagic extravasation.

### The Decidua in Early Pregnancy

Some lantern slides illustrated a few interesting points with regard to the decidua in early pregnancy. The first was a section of the uterus in a premenstrual condition, illustrating the condition before implantation. The second was the corresponding decidua from the last corpus luteum at the tenth week of pregnancy, which illustrated the fully developed placental attachment. During the period immediately preceding implantation and the period in which the trophoblast is actively growing there is an alteration in the mode by which the ovum obtains its pabulum. This slide was a photograph of part of the decidua of the ovum I described in the *Journal of Obstetrics and Gynaecology of the British Empire* (vol. xxxix, No. 3). It showed the surface epithelium of the uterus in a stage of active secretion, and one cannot doubt that this is a feature of early pregnancy due to corpus luteum activity, the function of which must be to provide pabulum for the ovum before and during embedding. That the human ovum rapidly frees itself from the influence of the corpus luteum is recognized in many reported cases of removal of the corpus luteum during pregnancy without interruption of the pregnancy.

The photomicrograph showed the first stage of invasion of the maternal blood vessels by the trophoblast, and again this specimen was derived from the 15-day-old ovum. Here were seen the chorionic villus, the proliferating cells of Langhans's layer, the implantation cavity, the resorption syncytium, and the proliferating syncytium. This proliferating syncytium, so fully described by Florian, is that part of the chorionic structure which is concerned with the invasion and destruction of the maternal decidua. The next slide showed the proliferating syncytium in a higher magnification, and here could be seen the syncytial structure displacing and replacing the endothelial wall of a dilated maternal capillary.

The points I wish to stress in this discussion are only concerned with the corpus luteum. I am satisfied that the administration of luteal extracts, in the present state of our knowledge, is not of great clinical use. Whether it will ever be of much advantage to produce an artificial menstrual cycle by the administration of folliculin and progestin is open to argument. However, the administration of progestin may be useful in cases of repeated and threatened abortion, and my experience with it has satisfied me that results can be obtained.

The corpus luteum extract may act in one of two ways. It may produce a satisfactory condition for embedding of the ovum if its administration is commenced before the first period is missed, and it may help to maintain the early decidua in a condition suitable for development of the placenta. Another way in which it may reduce the liability to abortion is that it reduces the irritability of the uterine muscle, rendering it less likely to undergo contractions.

I think we are all agreed with Professor Novak when he says that " . . . the results of gynaecological organotherapy have been disappointing, while the accomplishments of gynaecological endocrinology have been numerous and brilliant." I would also call attention to the paper by T. N. A. Jeffcoate on " Sterility Due to Ovarian Dysfunction " (*British Medical Journal*, February 23rd, 1935).

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Congenital absence of one kidney, though uncommon, is not extremely rare. A true unilateral kidney is usually associated with a single unilateral ureter and a single opening into the bladder ; thus half of the trigone of the bladder may be atrophied, and genital abnormalities may exist. The renal vessels are usually absent or quite rudimentary. Reports by different authors vary as to the frequency of absence of the corresponding suprarenal gland. J. R. H. Turton and J. C. F. Lloyd Williamson (*Brit. Journ. Surg.*, October, 1935, p. 327) record a case of rupture of a congenital solitary kidney, and refer to four others. This phenomenon is extremely rare ; it occurs most commonly in men, usually on the left side, and in young patients, the figures in the present series being : males to females, 4 to 1 ; left to right, 5 to 0 ; and average age 21 years. In cases of renal injury, where nephrectomy is contemplated, the following procedures are held by the authors to be vital. Where the patient's condition permits intravenous pyelography should be employed in order to demonstrate the presence or absence of a second functioning kidney. In the severe type, manual palpation for the contralateral kidney must be performed at the operation. If a solitary kidney is ruptured efforts should be made to arrest haemorrhage by conservative suturing or partial nephrectomy.

# REMOVAL OF TONSILS BY ELECTRICAL CURRENTS OF HIGH FREQUENCY

BY

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The successful scientific research on high-frequency electrical currents during the past thirty years has helped to improve electro-medical apparatus. It is now possible to obtain diathermy machines which generate high-frequency currents which will cut through living tissue cleanly, subsequent healing being by first intention, or will cause coagulation and electrical destruction to any required degree. This is indeed a great advance since the pioneer work of d'Arsonval in 1895 and Boudier and Lecomte in 1900. It was then only possible to produce electrical currents of long wave-lengths, and these caused local heating or uncontrolled coagulation.

The modern high-frequency diathermy current is produced by connecting the main alternating supply current of 200 volts, 50 to 60 cycles, to a step-up transformer, which raises the supply voltage. A series of condensers is placed in the circuit; this high-voltage current is discharged across a single or a series of tungsten spark-gaps, and currents of very high frequency are produced. In place of a tungsten spark-gap a triode valve may be employed. The high-frequency current is stored and conveyed through subsidiary condensers to the exit terminals and to the electrodes connected to the patient.

Beyond a critical frequency of approximately 1,000,000 cycles per second, the wave-length of the electrical current has little influence on the resulting action on the tissue. The intensity of the current, as controlled by the amperage and voltage and the size and nature of the active electrode, determines the final effects. Within a certain range, as the voltage is increased and the amperage is reduced, the wave-length becomes lengthened and frequency diminishes.

Electro-coagulation is produced by long wave-lengths. Clean cutting is produced by currents of lower voltage, higher amperage, and higher frequency or short wave-lengths. The knowledge and correct control of electrical apparatus is of great importance in this technique. High-frequency currents are of great value in surgical operations, since it is now possible to obtain electrical currents of sufficient energy which, when correctly applied, will cleanly cut or will coagulate and destroy tissue *en masse*.

The removal or destruction of the tonsils by the application of high-frequency currents has certain advantages over other methods of tonsillectomy. Theoretically the active electrode produces the combined effect of cutting and coagulation; the operation should be bloodless, since the heat generated coagulates and seals off blood vessels. The lymphatic vessels are similarly closed and, since the local heating effect is great, infective organisms within the tonsils are destroyed; the risk of spread of infection, therefore, should be greatly lessened.

The tonsils may be removed by means of one of two methods: (1) the complete removal at one operation under a general anaesthetic, or (2) the progressive destruction of the tonsils by treatment once a week. Each tonsil receives treatment at intervals of twelve to fourteen days. Each method has its advantages, which will be discussed later on after the technique of each method has been described.

## The Single Operation

Excision of the tonsils by means of high-frequency electrical current aims at complete removal in one operation. A general anaesthetic is employed. The use of chloroform and oxygen by means of the intratracheal method is essential, since the danger of combustion of ether or nitrous oxide from electrical sparking prohibits their use. It is possible that the use of intravenous injection of evipan, or similar basal anaesthesia, will be of great help, and will overcome the difficulty of anaesthesia in surgical diathermy. The patient's head is tilted back by placing a sand-bag under the shoulders. A Davis gag is inserted; the mouth is opened, and the pharynx is plugged with a strip of gauze. A motor-driven air pump helps, and the flexible lead tube is introduced along the floor of the mouth.

An indifferent electrode is applied to the skin of the thigh or arm. A sheet of lead covered by a saline pad may be used, but I prefer a thin phosphor-bronze chain mesh, 9 by 9 inches in size, which is directly bandaged to the skin of the thigh or forearm. The mouth is illuminated by a head lamp. The active electrode which I employ has already been fully described (*British Medical Journal*, 1931, i, 892). It consists of a tapering quartz rod curved at its tip. The quartz tube is bored in the centre like a capillary tube, and through this a fine molybdenum wire about 0.2 mm. thick is threaded. The wire projects for 2 mm. beyond the tip of the quartz tube, but the length of the active electrode can be regulated and simply adjusted.

An incision is made through the mucous membrane covering the anterior pillar of the fauces of the right side, and the right tonsil is grasped gently by means of a small vulsellum forceps. The tonsil is dissected and removed. It is necessary to try to avoid pulling on the tonsil, since this may lead to tearing, and cause bleeding which obscures the field and interferes with the efficient working of the electrical current. The tonsil should be gently cut away from its bed. At times the heat generated causes a cloud of steam and smoke; this is overcome by inserting a soft lead tube connected to a suction air pump. After the right tonsil has been removed the tonsillar bed is cleaned by means of a small sponge. Small bleeding points are treated by sparking and fulguration; the tonsil bed may be dealt with similarly by light fulguration. The left tonsil is removed in the same way.

The operation can be carried out with ease and rapidity; in successfully treated cases it is, at times, almost bloodless. If the tonsil has been torn and inefficiently treated bleeding may occur. The use of a sponge, applied with pressure and immediately followed by the application of the active electrode to the bleeding point, will arrest haemorrhage successfully. During the operation of tonsillectomy it is most surprising to observe the rapid shrivelling and contraction of the tonsillar lymphoid tissue; this is due to heating and coagulation. Should the vulsellum forceps slip and become detached, some difficulty may be found in establishing the anatomical relations at the field of operation.

Following tonsillectomy by this method, oedema of the soft palate and uvula develops during the next forty-eight hours. Pain and discomfort is slight, as a rule, and swallowing is less troublesome. The oedema usually subsides after the second day, except in those cases which carry a heavy infection of streptococci and allied throat organisms; such cases show more oedema, cervical adenitis, or pyrexia. A greyish-yellow-white slough forms at the tonsillar bed, at the site of the application of the high-frequency current. When this is well established there is little pain and discomfort. The slough forms an efficient barrier against the spread of pathogenic organisms to the lymphatic and blood streams. It should be well conserved and allowed to separate slowly in its own natural course, which lasts ten to twelve days. The use of hydrogen peroxide and other chemical agents which attack this slough should be avoided.

Young children respond well to this technique of treatment. They are usually active and feel well within forty-eight hours. Pain is, on the whole, less than in the other methods of open dissection, since there is so little interference with the pillars of the fauces; the use of forceps and ligatures to tie off bleeding vessels is unnecessary. The operation should be of value in the

removal of chronically infected tonsils, in tuberculous disease, and also in the removal of doubtfully malignant tonsils, since the electrical coagulation necrosis is a firm barrier against spread of infection or metastasis.

Six months after a successful operation there remains a white scarred area, with the typical fibrosis following surgical diathermy. The scar is soft and pliable, with little contraction. If the operation has not been fully successful tags of tonsillar tissues or an irregular mass of granulation tissue may be removed by further treatment under a local anaesthetic. Haemorrhage following surgical diathermy of the tonsils is of no greater frequency than that caused by other surgical methods. It is very rare in young children. In adults haemorrhage may occur during the first forty-eight hours ; it is usually due to failure to completely seal off bleeding points or to disorganization of the coagulated tissue by vomiting or retching after the anaesthetic. Such haemorrhage must be rapidly treated by sparking and coagulating an isolated bleeding point by means of the active electrode of the high-frequency current. If the haemorrhage is due to a general oozing of diffused areas it is necessary to suture the pillars of the fauces by the usual technique.

It is obvious that the operative technique of direct tonsillectomy can only be really successfully performed by the specialist surgeon who has practical knowledge of oral surgery, and has adequate training in, and equal experience of the working of, electro-medical apparatus and the nature of the high-frequency electrical currents which are needed. The technique is not necessarily advocated to replace completely the older established methods of tonsillectomy. There are definite indications for this technique in selected cases, provided that both surgical skill and adequate knowledge of the application of high-frequency electrical currents are available. Such specialized knowledge and training are essential.

## Progressive Electro-Surgical Diathermy

The removal of tonsils by progressive electro-surgical coagulation has the advantage that tonsillectomy is slowly performed while the patient is active and continuing routine daily work. The necessity for general anaesthesia, rest in bed for ten to fourteen days, and subsequent convalescence is avoided. This appeals to patients who dread anaesthetics and surgical operation, but it follows that many in this group are highly nervous, and are not ideal patients for operative manipulation of the throat. It is not advisable to perform this operation on the young under 16 years of age, since they are naturally averse to such procedure.

Treatment is undertaken once a week, the right and left tonsils being dealt with alternately. Each tonsil therefore receives treatment at intervals of about fourteen days—on an average six to eight treatments ; thus three to four treatments of each tonsil are necessary to complete tonsillectomy, the number varying with the size and nature of the tonsil. The procedure takes six to eight weeks. The improvement of electro-medical apparatus has greatly facilitated the success of this operation, for, by means of a suitable active electrode and electrical apparatus generating an adequate intensity and suitable current, satisfactory coagulation necrosis is obtained.

The patient is placed in an armchair which has an adjustable head rest. A projection inspection lamp is placed behind the patient, and a beam of light is projected into the mouth by means of a head mirror. It is advisable for the operator to wear a face mask. The mucous membrane of the roof of the mouth, the soft palate, and the pillar of the tonsil are anaesthetized by spraying them with a solution containing 10 per cent. cocaine, 1 per cent. diamorphine hydrochloride, and 0.1 per cent. menthol. This solution is placed into a two-ounce Devilbiss spraying bottle attached to an electric motor-driven air pump. The spray is forcibly ejected without fatigue to the operator, and by this means successful local anaesthesia is induced. I have found this method superior to swabbing with cotton-wool, and much less trouble than local injection of the pillars of the fauces.

The technique employed should always be as simple as possible, and involve the minimum of manipulation in the mouth. As an indifferent electrode a phosphor-bronze chain mesh about 9 by 9 inches in size is bandaged directly to the skin of the forearm. The room is semi-darkened, and light is subdued. The active electrode which I employ is the similar quartz-molybdenum-wire electrode which has already been described. The tongue is depressed by means of a tongue depressor with an electric torch attached. A head lamp or a head mirror may be used in conjunction with a glass or metal tongue depressor. The right tonsil is treated first.

A semilunar incision is made through the mucous membrane covering the anterior pillar of the fauces. This is of great advantage, since by this technique the tonsil is dislocated from its bed, and the removal of a hidden or buried tonsil is much facilitated. Further, the use of special retractors for pulling aside the anterior pillar of the fauces and exposing a hidden tonsil is quite unnecessary. Following this operation, the anterior portion of the tonsil is treated in three to four areas, and a yellowish-grey coagulum forms. The area treated is finally given surface fulguration. It is necessary that the correct type of high-frequency current should be employed during the operation, since coagulation at a depth is necessary. The electrode should be removed with ease, and should be perfectly cleaned when withdrawn from the tonsil. If the electrode sticks within the tonsil it becomes covered with adherent coagulum ; this has to be pulled away, so that the tonsil is torn, and bleeding results. In the treatment of septic tonsils, when the electrode is inserted in the tonsil pus may be seen to exude from many crypts and follicles in several surrounding areas. This is due to the heat affecting the whole tonsil. The lymphoid tissue rapidly contracts and the tonsil shrivels up and becomes much smaller during treatment.

The first treatment of each tonsil is of much importance. It is usually followed by oedema and swelling, and gives the greatest reaction and pain. The patient is told to gargle well with a 5 per cent. solution of borax, 0.1 per cent. menthol, and 1 in 1,000 carbolic acid solution, using 1 drachm to 10 ounces of water. The oedema subsides after forty-eight hours, and a firm coagulum is formed. This should be allowed to separate slowly in its natural course, and not be irritated in any way. A severer reaction may ensue in cases in which the tonsils are infected with virulent haemolytic streptococci and allied bacteria. Treatment should not be applied during any stage of active inflammation, such as acute pharyngitis or subacute tonsillitis, since severe reaction may result and cause painful swelling of the cervical glands, pyrexia, and general malaise.

A week after the first treatment the left tonsil is dealt with in a similar manner. At this stage the right tonsil usually presents a firm slough at the site of application of the high-frequency current. This should now be painless, and begin to show separation. The first treatment to the right or left tonsil causes the most pain and severe reaction of the whole treatment. This is due to the reaction following the incision into the mucous membrane of the anterior pillar of the fauces, and to the coagulation and heat sterilization of the tonsil. General constitutional reaction may follow the absorption of killed bacteria and coagulated septic lymphoid tissue. The application of high-frequency electrical currents to granulation tissue and the lymphoid tissue of the tonsils causes very little pain or discomfort.

The second stage of treatment to the right and left tonsils is applied to the posterior portions which remain attached to the posterior pillars of the fauces ; it is usually undertaken during the third and fourth weeks. The anterior portion of the tonsil has been removed ; the coagulation and slough have separated, leaving a clean red granulating area, and showing a surface exudation of sero-pus, the remaining follicles or crypts being filled with caseating pus. Treatment should not be begun until the slough has completely separated and the acute inflammatory reaction resulting from previous treatment has subsided. If necessary, it should be delayed for a further week until this has occurred. The treatment of the posterior area of the tonsil may give rise to pain on swallowing, and may also cause earache. This is due to reaction at the posterior pillar of the fauces and referred pain from the posterior auricular nerve. These symptoms usually subside within forty-eight hours after treatment.

The third stage of treatment is applied to the base of the tonsil, the remnants of tonsillar tissue, and the lower pole towards the lingual portion of the tonsil. The right and left tonsils are usually treated alternately at the fifth and sixth weeks. However, if the tonsils originally were not very large in size, both can sometimes be treated at the same session. This causes very little pain or reaction, since the bulk of the tonsil has now been removed, and the infection is much reduced. The treatment may be continued at weekly intervals until the whole tonsillar tissue has been destroyed and removed. The patient reports for inspection at monthly intervals. As the healing progresses and fibrosis occurs, it is possible to determine the degree of success, and if necessary to advocate further treatment. A successful operation should show a clean granulating bed between the pillars of the fauces; this finally heals by forming a greyish-white area of scar tissue, with very little contraction or deformity.

The older methods of treatment, described by Dan McKenzie and Bulmer, advocated the use of specially designed electrodes of many varied sizes and patterns. These electrodes are too large, being about 3 mm. in diameter and 1 cm. long. The improvement in diathermy apparatus which now generates electric currents of higher frequency, and the use of a much smaller active electrode (0.2 mm. in diameter and 2 mm. long) results in a more defined and regular area of coagulation, diminishing the danger of tearing the tonsil and surrounding tissues. The older methods do not allow such high energy to be applied, and the coagulum sticks to the electrode, being partly detached and pulled away from the tonsil when the electrode is removed. The apparatus should be kept switched on during the whole process of treatment; it is not switched off until the electrode has been removed from the tonsil.

The number of treatments necessary depends upon the original size of the tonsil and to some extent upon the behaviour of the patient. With nervous patients and those who resist and are irritated by manipulation of the mouth and tongue it is necessary to proceed slowly, and to be satisfied with slow progress at each treatment. The small, hard, fibrotic and adherent tonsils seen in elderly people, and the remains of tonsillar tags following an incomplete tonsillectomy, respond well to this method of treatment.

The danger of haemorrhage is not great; it compares favourably with the incidence of haemorrhage following routine surgical tonsillectomy. Haemorrhage may occur within forty-eight hours after treatment; this is rare, and is due to straining of the throat and palate, causing detachment of the slough and damage of the blood vessels. It can usually be arrested by the application of the active electrode or fulguration to the bleeding point. Haemorrhage may also occur five to seven days after treatment, owing to premature separation of the slough and coagulum or to bleeding from granulation tissue. The application of electrical fulguration, or of the high-frequency current, to the area of haemorrhage is usually sufficient to arrest and control this. I have seen only three cases of haemorrhage during the progressive treatment of 250 patients.

## Conclusion

The application of high-frequency electrical currents, commonly called surgical diathermy, may be employed successfully to remove and destroy the diseased tonsil. The technique of progressive destruction by coagulation has advantages, since this operation can be performed while the patient continues with routine duties. The procedure is slow, involving treatment at weekly sessions for six to eight weeks. The discomfort and disturbance incurred by the patient is not really great, especially in suitable types of cases, but in the highly strung and nervous patient it causes apprehension and fear. However, I have managed to complete treatment in all the cases I have attempted, and no patient has, as yet, failed to complete treatment once he has agreed to start.

# OXYGEN ADMINISTRATION BY NASAL CATHETER

BY

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For prolonged administration of oxygen by any method it is now generally agreed that the proportion of oxygen in the inhaled air should be between 35 and 60 per cent. This means that the alveolar air should contain at least 30 to 55 per cent. of oxygen. Lower percentages have little therapeutic value; higher percentages are irritant, and may cause fatal inflammation of the lungs. The definition of the optimal range of oxygen concentration for prolonged administration has been the result of much

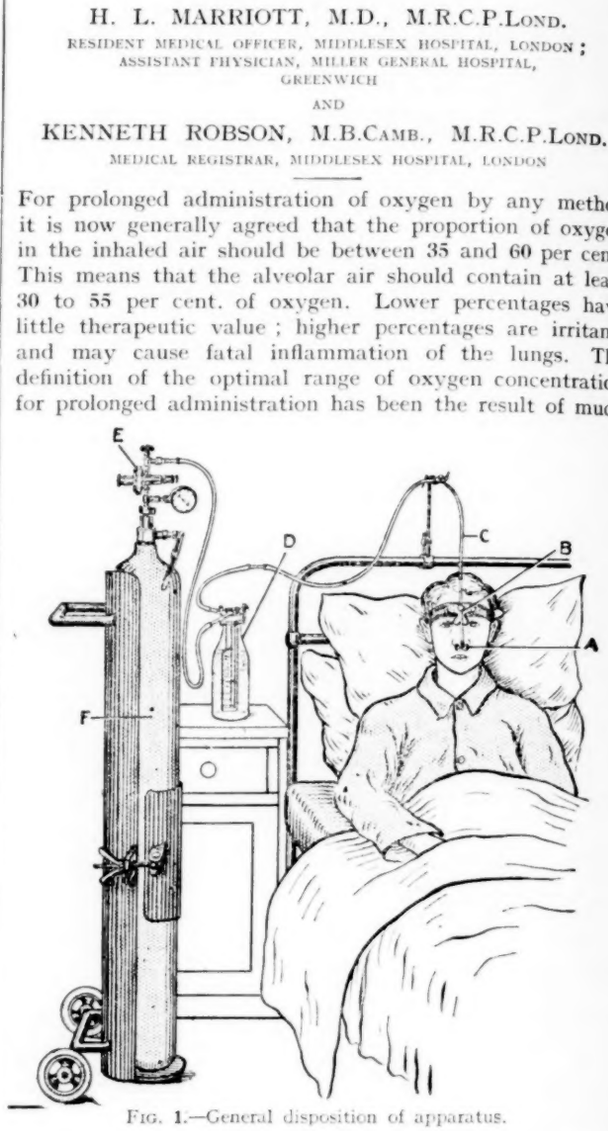



FIG. 1.—General disposition of apparatus.

experimental study by many investigators. This work has been reviewed by several authors.[1 2 3]

There is a widespread impression that oxygen concentrations within this optimal range cannot be attained by nasal catheter administration. Recent work in America[4 5] has challenged this view, and the claim has been made that the nasal catheter method can be completely effective, provided that adequate flows of oxygen are used—namely, 4 to 16 litres per minute. Such flows are far greater than those at present generally used. When released under water they cause a boiling turbulence, not the well-known little trickle of easily counted bubbles.

The importance of the subject and the American communications stimulated commencement of the work recorded in the present paper. Preliminary trials upon ourselves and upon patients seemed to confirm the general truth of the claim, but there appeared to be room for improvement of apparatus in several respects. The purposes of this article are: (1) to describe apparatus presenting certain new features; and (2) to record experimental data concerning alveolar oxygen concentrations obtained with the apparatus.

## Description of Apparatus

The description printed below is related to the lettering which labels the various parts of the apparatus in the accompanying illustrations.

### *The Catheters* (A)

Two catheters, each 3½ inches in length, are used. When a single catheter is employed there is the disadvantage that it is necessary for the tip of the catheter to lie in the oropharynx, about level with the tip of the uvula, because otherwise the oxygen tends to turn around the back of the nasal septum, and flow out of the other nostril rather than pass the soft palate to enter the oropharynx.[4] If two catheters are used there is an inflowing blast on both sides of the nose which prevents doubling back of the oxygen stream. In our technique about three inches of each catheter lie within the nose. Personal experience has shown that it is much more comfortable to have two passed only so far, rather than to have one with its tip in the oropharynx. Introduction of a catheter into the oropharynx involves a not negligible amount of discomfort. While spraying with cocaine anaesthetizes the nose, it does little to the more inaccessible nasopharynx. Maintenance of the catheter tip in the oropharynx is locally trying, and may involve serious abdominal distension from swallowing a bolus of oxygen with every mouthful of saliva or food.

The catheters used are pieces of ordinary cycle valve tubing. This tubing has the advantages of being extremely soft and thin-walled. Its lumen is of the minimum cross-sectional area necessary to accommodate the oxygen flows required. Ordinary rubber catheters with the same size lumen are much thicker and stiffer. Another advantage of cycle valve tubing is its great cheapness ; twelve yards cost 4s.

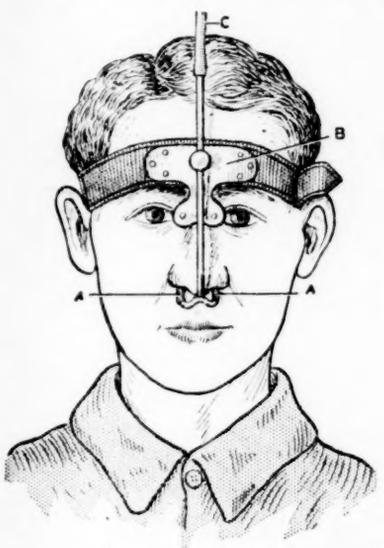
### *The Catheter Carrier* (B)

The common method of securing nasal catheters in position by strapping affixed to the cheek is insecure and uncomfortable. Insecurity is a serious defect. If the catheter falls out and the percentage of oxygen in the inhaled air drops from 55 per cent. to the normal 21 per cent., it may be equivalent in its effect upon an anoxic patient to the effect upon a normal individual of suddenly raising him from sea-level to a very high altitude. Incidentally, when effective oxygen administration is being discontinued the process must be a gradual one, and also during changing of cylinders the interruption of supply should be avoided by use of suitable connexions.

The suggested catheter carrier is primarily intended to achieve greater security. It is an adaptation of the laryngologist's head-mirror strap, which in the course of years has evolved into a very serviceable and comfortable device. There is nothing new in head-band nasal catheter carriers,[6 7] but, so far as we know, they have failed to conform to the head-mirror strap in that they have omitted the two padded knobs which lie upon either side of the nose. These knobs are fundamental to the security of the apparatus, and the plate which carries them must be bent so that they fit snugly. The head-strap should buckle at the side instead of at the back. It must lie below the external occipital protuberance. The strap cannot be displaced upwards because of the orbital margins in front and the occipital protuberance behind. It cannot be displaced downwards because of the ears. It cannot slip around the head because of the anchorage to the nose by the two knobs. The ordinary head-mirror strap carries a padding of wool and washleather to protect the forehead. We have removed this and substituted corrugated rubber of the type used for surgical drainage and resembling corrugated packing cardboard. This corrugated rubber is more comfortable, and its vertical grooves allow perspiration to drain away. The pronged tube which bears the catheters is carried in a collar, fitted with a screw, so that it may be moved up and down as desired. The tube is 3/16 inch copper tube, annealed to make it malleable, and nickel-plated.

The carrier, with catheters attached, is strapped to the head before the catheters are introduced. Each catheter may be slipped on to its prong while being held stretched upon the points of a pair of fine sinus forceps or Spencer Wells forceps (see Fig. 4).

The shortness and softness of the catheters permit their introduction, if necessary, without anaesthetization of the nose. It has, however, generally been our practice to spray the nose five minutes beforehand with a cocaine and adrenaline solution. Lubrication of the ends of the catheters with liquid paraffin is important. Personal trial and the opinions of patients and nursing staff indicate that the catheter carrier can be worn with comfort for indefinite periods and that high rates of flow are well tolerated.



FIGS. 2 and 3.—The catheter-carrier.

FIG. 4.—Method of attaching catheter to catheter carrier.

*Tubing Attached to Catheter Carrier* (C)

Thick-walled tubing which will not readily kink is desirable. The type technically known as "aspirating tubing" is convenient; its external diameter is 6 mm. The weight of the tubing must be supported so that it does not pull upon the patient (see Fig. 1).

*The Flowmeter and Humidifier* (D)

Effective oxygen administration by nasal catheter demands accurate measurement of the flow employed. Dial flowmeters are adapted pressure gauges, and have the very grave defect of only registering accurately if the outflow is unobstructed. If obstruction occurs, as, for example, by kinking of catheters or tubing, the dial records an increased flow although the flow has actually been diminished. In this way wrong measurement to huge extents may occur.

The flowmeter depicted (Figs. 1 and 5) was specially designed for us by Mr. C. Durant of the British Oxygen Company. It is an original type of water flowmeter and fills a long-felt want. It registers accurately the actual flow passing by the movement of the level of a water column against a graduated scale. A small coloured bead floating on the top of the column renders reading of the

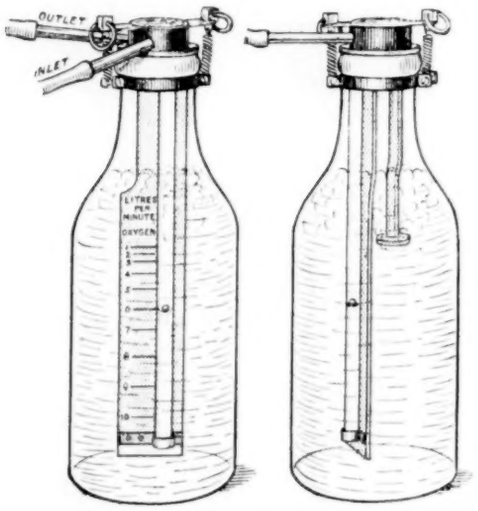



FIG. 5.—The flowmeter and humidifier.

level an easy matter. In the experimental determinations, recorded later on in this paper, the flowmeter was checked by water displacement before every experiment and found invariably correct.

The springs holding down the bung of the flowmeter are made to give way, allowing the bung to lift if pressure rises much in the bottle. Hence there is no danger of the bottle bursting, should an inexperienced person attach it to a cylinder not fitted with a pressure regulator.

Oxygen administered by nasal catheter must be humidified by passage through water, so that unpleasant drying of the mucous membranes shall not occur. This flowmeter acts also as a humidifier. The model depicted does not provide quite sufficient depth of water for this purpose, and also does not register beyond 10 litres per minute. A new model provided with a taller bottle will shortly be put upon the market. In our experiments with flows above 10 litres we used two of the present flowmeters linked together.

*Oxygen Cylinder Pressure Regulator* (E)

The oxygen cylinder should be fitted with a pressure regulator which automatically reduces the pressure to 3 to 5 lb. The type illustrated is the standard regulator of the British Oxygen Company.

*The Oxygen Cylinder and Cylinder Stand* (F)

Effective nasal catheter administration of oxygen demands flows of 4 to 16 litres per minute. With such flows small cylinders are very quickly exhausted. It is advisable to use cylinders of at least 100 cubic feet capacity. Large cylinders have the additional advantage of being very much cheaper. At 8 litres a minute such a cylinder lasts about six hours, since 1 cubic foot equals 28.3 litres.

Large cylinders, however, may be difficult to transport. The cylinder stand of the porter's barrow type depicted in Fig. 1 was made for us by Messrs. Brown and Tawse, and enables these large cylinders to be wheeled at a walking pace with ease by the smallest nurse. The base-plate flush with the ground makes the loading of new cylinders a simple matter. The cost in oxygen per twenty-four hours at flows of 4 to 16 litres per minute is roughly 10s. to £2.

*Table of Results of Analysis of Samples of Alveolar Air at Different Rates of Oxygen Flow in two Subjects.*

| Oxygen Flow in Litres per Minute | Subject I | | | | Subject II | | | |
|---|---|---|---|---|---|---|---|---|
| | Mouth Open | | Mouth Shut | | Mouth Open | | Mouth Shut | |
| | $O_2$ % | $CO_2$ % | $O_2$ % | $CO_2$ % | $O_2$ % | $CO_2$ % | $O_2$ % | $CO_2$ % |
| 4 | 33 | 5.7 | 29 | 5.8 | 27 | 4.9 | 29 | 5.3 |
| 8 | 39 | 5.2 | 42 | 4.8 | 37 | 4.9 | 40 | 5.5 |
| 12 | 47 | 5.1 | 52 | 5.7 | 38 | 4.9 | 42 | 5.4 |
| 16 | 63 | 5.5 | 58 | 5.2 | 54 | 5.1 | 52 | 5.7 |

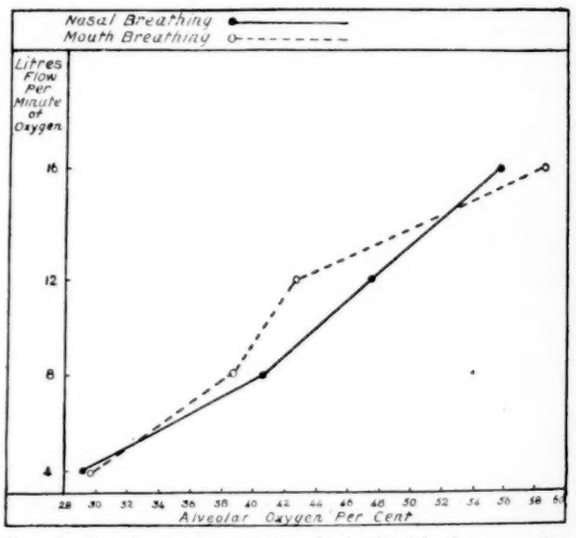



FIG. 6.—Graph of mean results obtained with the apparatus described.

## Oxygen Concentrations in Alveolar Air

The determinations were made upon two normal subjects. Samples of alveolar air were collected by the syringe and whistling method.[5] A cannula bearing a tap was fitted to the syringe, making it possible to close the syringe to the outside air before withdrawal from the subject's lips. The subject was seated and the oxygen, at the flow under investigation, was administered for five minutes before the sample was taken. At the beginning of the whistle the subject pinched his nose and the catheters, and the oxygen flow was stopped by cutting through the connecting tube with scissors. The samples were analysed in a Haldane gas analysis apparatus. The carbon dioxide concentrations of the samples ranged between 4.8 and 5.8 per cent., which appeared to show that deep alveolar air was being obtained.

For each subject two sets of determinations at 4, 8, 12, and 16 litres per minute were made. In the first set breathing was through the nose, and in the second through the mouth. Mouth-breathing appeared to make little difference, as will be seen from the table and graph (Fig. 6).

Many more analyses were made than are represented in the above table. Oxygen figures are given to the nearest whole number. It would be misleading to suggest that greater accuracy is possible, as there are important potential sources of error in both sampling and analysis. It seems probable that, taking everything into consideration, the margin of experimental error may well be up to 5 per cent.

The effect of different rates of respiration was not determined, since this has been done very thoroughly by Barker, Parker, and Wassel[5] using the oropharyngeal technique on three normal subjects. They found that respiratory rates of 16, 30, and 60 per minute made little difference to the alveolar concentration of oxygen at the rates of flow under study. Our results accord closely with those of these workers. The graph from their paper is reproduced in Fig. 7.

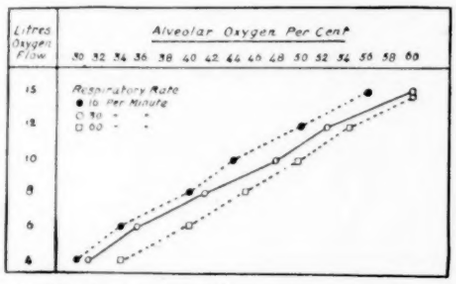



FIG. 7.—Graph reproduced from paper by Barker *et al.*

## Summary

1. Apparatus, new in several respects, for the nasal catheter administration of oxygen has been described.

2. Alveolar oxygen concentrations, at flows from 4 to 16 litres per minute, ranged from 29 to 58 per cent. (mean values). Thus the fact that optimal concentrations of oxygen for prolonged administration can be obtained by the apparatus has been demonstrated.

We wish to express our thanks to Professor Samson Wright for great help and encouragement. Mr. D. Russell Davis most kindly consented to act as one of the subjects in the investigation. Mr. S. A. Sewell has taken considerable trouble with the illustrations.

The catheter carrier may be obtained from Messrs. Bell and Croyden of Wigmore Street, London, W.1.

### REFERENCES

[1] Campbell, A., and Poulton, E. P.: *Oxygen and Carbon Dioxide Therapy*, 1934, London.
[2] Potts, W. H.: *Amer. Journ. Med. Sci.*, 1932, clxxxiv, 616.
[3] Boothby, W. M.: *Journ. Amer. Med. Assoc.*, 1932, xcix, 2026 and 2106.
[4] Wineland, A. J., and Waters, R. M.: *Arch. Surg.*, 1931, xxii, 67.
[5] Barker, M. H., Parker, D. M., and Wassel, G.: *Journ. Amer. Med. Assoc.*, 1934, ciii, 244.
[6] Bourne, G.: *Lancet*, 1922, ii, 23.
[7] *Journ. Amer. Med. Assoc.*, 1934, cii, 1870.
[8] Beaumont, G. E., and Dodds, E. C.: *Recent Advances in Medicine*, seventh edition, 1934, London, p. 123.

The Anti-noise League, 66, Victoria Street, S.W.1, announces that in response to many inquiries it has published further leaflets, which form part of a series now in preparation. They include a note on that branch of hospital planning which is directed to the prevention of noise, and similar pamphlets refer to noise in schools and in domestic buildings. There are notes also on the protection of night workers from noise during the day. Suggestions are made as to the best methods of dealing with the more common noise complaints.

# SPLENECTOMY FOR THROMBOCYTOPENIC PURPURA

BY

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The disease known as purpura haemorrhagica embraces a number of different conditions the aetiology of which is not clearly understood, but essential thrombocytopenic purpura haemorrhagica has now been separated from the general group of purpuric diseases, and cases of it can be diagnosed with some certainty. The characteristic features are purpura, haemorrhages from various organs, a diminished platelet count, and prolonged bleeding time. The condition may be acute or chronic, and occurs in children and adults. There is much interest in the blood changes and in the differential diagnosis of the disease, but the surgical importance lies in the treatment of the established condition. Surgical treatment was only considered just less than twenty years ago, when Kaznelson first performed splenectomy for it, and a review of the literature and medical textbooks reveals considerable divergence of opinions on the indications for the operation, and also on the late results of medical and surgical treatment.

In view of this it seems important that yet more isolated cases should be published, as the condition is uncommon, and a large series must eventually be collected before the best method of treatment can be established. A brief record is therefore given of a case treated by splenectomy over a year ago, whose progress has so far been satisfactory, and can be reported on again at a later date.

## Case Record

A married woman, aged 41, was admitted to the South London Hospital under the care of Dr. Pickard on February 17th, 1934.

*History.*—For six weeks the patient had noticed a rash on the chest and back, bruising of the limbs, and occasional bleeding from the gums. Epistaxis had occurred once. Menstrual periods had previously been normal, lasting seven days, but the one just prior to admission had commenced ten days early, lasted ten days, and had been unduly profuse. She had no children, and had had no miscarriages. She had been in good health up till this time.

*On admission* the general condition was quite good; colour fair. The gums were unhealthy, and were bleeding at several points. The abdomen was covered with a purpuric rash, which was also visible on the back. The spleen could not be felt. Heart and lungs, pelvic organs, and urine were all normal. Blood count: red blood cells, 4,190,000; haemoglobin, 70 per cent.; colour index, 0.83; white blood cells, 6,000; some anisocytosis.

*Progress.*—On February 22nd uterine haemorrhage recommenced, and was very profuse. More subcutaneous haemorrhages appeared. Blood count: red blood cells, 3,100,000; platelet count, 21,700. March 3rd: retinal haemorrhages occurred in both eyes. March 5th: blood count—red blood cells, 3,333,000. March 9th: bleeding from gums more severe; blood transfusion given. March 15th: blood transfusion repeated. March 19th: uterine haemorrhage commenced again, with profuse loss. March 23rd: blood count—red blood cells, 2,470,000; platelets, 17,500. General condition much worse, patient very pale, pulse rapid and of poor volume. As all types of haemostatic drugs had been given without effect, it had already been decided that splenectomy was necessary, but the patient had become so much worse during the last twenty-four hours that it was obvious that she would die very soon, and that operation must be undertaken at once, if at all.

*Operation.*—Emergency splenectomy was performed. The spleen was about one and a half times the normal size, and there were no adhesions. The operation was rapidly com-

pleted as the patient's condition was extremely poor. Bleeding from the abdominal wall was easily controlled as soon as the splenic pedicle had been ligated.

*Post-operative Progress.*—Saline infusions were given for twelve hours, during which time the condition was critical, but there was no more uterine bleeding. After this there was no further anxiety, and progress was steadily maintained. The gums healed rapidly, and necessary dental extractions were performed before discharge from hospital without any undue bleeding. The patient was sent to a convalescent home on May 22nd.

The following summary of some of her post-operative blood counts shows the rate of recovery of red cells and platelets.

| | Red blood cells | Platelets per c.mm. |
|---|---|---|
| March 26th ... ... | 2,100,000 | 26,700 |
| March 28th ... ... | 2,360,000 | 50,000 |
| April 7th ... ... ... | 2,800,000 | 67,000 |
| April 18th ... ... | 3,870,000 | 121,000 |
| May 18th ... ... | 4,320,000 | 121,000 |
| November 15th ... ... | 4,200,000 | 140,000 |
| December 5th ... ... | 4,300,000 | 200,000 |
| May 7th, 1935 ... ... | 4,250,000 | 250,000 |

Haemoglobin, 90 per cent.

Menstruation did not return until three months after operation, and the periods have since been regular and not excessive. In May, 1935, the general condition was very good. The colour was excellent, and there had been no return of haemorrhages or purpura.

Pathological report of the spleen is as follows: Spleen enlarged and of normal shape. Microscopical examination shows dilated venous sinuses with thickened walls. The Malpighian bodies are of normal size; large mononuclear cells, some being degenerate, are seen in the centre of the bodies. Giant cells are not seen.

## Discussion

This case would be properly classed as one of acute thrombocytopenic purpura haemorrhagica. As far as can be ascertained the acute cases form about 20 to 25 per cent. of the total number, and the immediate mortality after splenectomy is given by Price[1] as 80 per cent. Pemberton[2] reports eleven cases treated by splenectomy, with two deaths, while Marzullo[3] mentions three deaths in four cases, but in the same series there were four patients treated medically, and these all died. It is probable that, with an earlier diagnosis and decision as to the necessity for surgical treatment, the immediate mortality can be considerably reduced, and should not be higher than 15 to 20 per cent. in the acute cases. Undoubtedly in the case here reported surgical treatment saved the patient's life, and probably should have been undertaken some days sooner.

It is more difficult to trace the subsequent history of those patients who recover from operation and to say what proportion of them are liable to suffer from a recurrence of the symptoms. In Pemberton's[2] series, of the nine patients who recovered only one is stated to have suffered from later haemorrhages, the others remaining well for periods up to eight years after operation at the time of reporting.

The value of splenectomy for chronic cases is more controversial. The immediate operation mortality rate is much lower than in the acute cases. Price[1] gives 8 per cent., and Pemberton's[2] series from the Mayo Clinic shows thirty-four patients with no deaths directly attributable to the operation. There was one death five years later, from severe uterine bleeding at the onset of puberty. Recurrent attacks of bleeding occurred in ten cases, but showed a tendency to get less and less severe, only persisting eventually in four cases. Spence[4] reviewed 101 cases in the literature in 1928, and found that splenectomy was beneficial in 16.6 per cent. of acute cases and in 80.9 per cent. of chronic cases. As some of these reports were only made a year after operation the figures are not so valuable, as recurrences may take place later. Myers[5] reports three cases well after periods of eight years (two patients) and three and a half years (one patient).* Hartfall and Oldfield[6] published an interesting account with full blood counts, in a woman of 25, whose only symptom was menorrhagia. Splenectomy was successfully performed, and the patient had remained well for a year at the time of reporting.

Until more knowledge of the pathology of the disease is gained the value of any one method of treatment must be based on records such as these. Evidence is in favour of the spleen being only one part of a diseased reticulo-endothelial system, and some observers do not recommend splenectomy on the grounds that only partial removal of the diseased tissues is thereby effected. It seems that the spleen is certainly one of the largest single structures affected, and if clinical results show that patients are improved and remain well, it would appear wiser to base treatment on these results.

It is clear that the actual platelet count is not a certain index of the severity of the disease, nor of the degree of recovery after operation. The platelet count may rise immediately the splenic vessels are secured, but may not show any increase for some days later. The criterion of permanent recovery is freedom from haemorrhages and purpura over an indefinite number of years. The presence of accessory spleens is occasionally a cause of return of symptoms, and they should be looked for at operation and removed if found.

The figures quoted above show that in a certain number of cases a long period of good health has been assured by operation in the acute and chronic states of the disease. In acute cases which fail to respond to medical measures the mortality without surgical intervention is in the region of 100 per cent. In chronic cases the indications are not so clear, but splenectomy would appear advisable in those of moderate severity which fail to improve with drugs and blood transfusions, or suffer from acute exacerbations of purpura, with a persistent low platelet count. Cases of mild severity will respond to treatment of anaemia and removal of septic foci. A certain percentage of recurrences must be expected, but one may anticipate that even then the symptoms will gradually lessen and eventually disappear in the majority.

## Conclusions

1. A case of acute purpura haemorrhagica in a woman of 41 years is recorded. Splenectomy was successfully performed, and the patient remains in very good health fifteen months after operation.

2. The immediate and remote results of splenectomy for this condition are discussed.

3. Conclusions based on published cases show that splenectomy is certainly indicated in acute cases with severe bleeding, and delay in operating adds to the operative risks. In chronic cases splenectomy should be considered in all except the mild ones, but though the immediate mortality rate is much lower, permanent cure cannot be expected in every case.

My thanks are due to Dr. Ellen Pickard for asking me to treat this case, and to Dr. Whittingham, pathologist to the South London Hospital, for numerous blood examinations and reports.

### REFERENCES

[1] Witts, L. J.: *Price's Textbook of Medicine*, fourth edition, 1933, p. 806.
[2] Pemberton, J. de J.: *Amer. Journ. Surg.*, 1934, xxiv, 793.
[3] Marzullo, E. R.: Ibid., 1933, xxii, 92.
[4] Spence, A. W.: *Brit. Journ. Surg.*, 1928, xv, 466.
[5] Myers, B.: *St. Bart's Hosp. Journ.*, 1933, xli, 44.
[6] Hartfall, S. J., and Oldfield, C.: *British Medical Journal*, 1934, ii, 8.

* See also *British Medical Journal*, September 7th, 1935, p. 445, published after this paper was submitted.

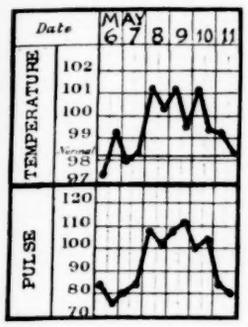
# Clinical Memoranda

## Gas Gangrene in a Child

Gas gangrene is apt to be looked upon as a purely war-time disease. Nevertheless it is always with us, and its insidious onset but calamitous consequences should never be lost sight of. Probably my acquaintance with it is no less than that of most post-war practitioners. Before I encountered the case recorded below I had seen only one alarmingly fatal case following upon a road accident in South Africa.

### CASE REPORT

On the afternoon of May 6th, 1935, a boy of 14 years fell from a contrivance called a "maypole" in a children's playground. A laceration over the right ankle bled profusely, and willing helpers thrust his sock firmly into the wound. He was taken to the theatre about two hours later. There was a compound fracture of the right ankle-joint such that the inferior articular surface of the tibia presented through the wound. Bruised tags of tissue were cut away and the skin edges excised. The whole wound was flushed with hydrogen peroxide and then with a 1 in 2,000 acriflavine solution, this sequence having appeared to me in the past to prevent growth of pus-producing organisms in such wounds. The dislocation was readily reduced and the wound partially closed over a small rubber drain running down as far as the joint capsule.




I am indebted to the sister in charge of the case for the temperature and pulse readings shown on the accompanying chart, and for the following notes:

*Day of Admission (May 6th).*—Taken to theatre 6.30 p.m. Wound washed out with acriflavine lotion; leg put up in plaster. Antitetanic serum (3,000 units) administered. *Night:* slept very little; circulation in toes good.

*Second Day.*—Plaster bivalved; acriflavine dressing to wound. Full diet. *Night:* slept very little; leg painful at times; circulation in toes brisk.

*Third Day.*—Vomited undigested food (light diet); appeared ill. Haemorrhagic discharge from wound. All stitches removed. Very drowsy, and delirious at times. *Night:* delirious at times. Hot boric fomentations to wound; haemorrhagic discharge still present.

*Fourth Day.*—On removal of dressing gassy froth seen to exude from wound, which was bluish and puffy. Decision to amputate was made. Amputation performed above the knee. Drain inserted. *Night:* patient still very ill; rectal glucose and salines given.

*Fifth Day.*—Morphine and rectal salines given as ordered; hydrogen peroxide dressings. *Night:* appeared a little brighter.

*Sixth Day.*—Condition much improved. Fluid intake increased. *Night:* condition satisfactory.

The amputation was of necessity done hurriedly, and on the fifteenth day, the patient's condition being greatly improved, the suture line was cleaned out and trimmed.

### COMMENTS

It was noteworthy that thirty-six hours passed before any change in pulse and temperature; up till then the wound appeared very well, and it seemed probable that no active pus formation was starting. Even when the pulse and temperature had risen the wound appeared very well at first, but the boy was obviously ill. Next day the few tell-tale bubbles of gas were seen, and I am greatly indebted to Dr. C. Rivers and Dr. H. L. Shimmin for strengthening me in my decision to amputate without delay. After amputation the patient's condition was poor for days. He was sweating, very pale, and very thirsty. He did not begin to pick up well until he was moved out on to the balcony. It seems that removal of the infected tissue by no means guarantees recovery. He is now very fit.

A swab taken at the time of amputation was cultured by Dr. Rivers. The method used was that of thorough mixing in melted glucose agar, solidification, and then incubation (Liborius). At the end of twelve hours the gelatin was showing the typical exploded appearance. No attempt was made to identify the anaerobe concerned.

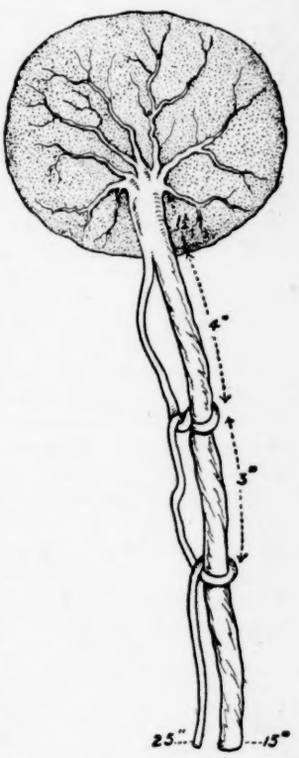
The source of the infection may have been: (1) the boy's sock, though this had been put on clean that morning; (2) the soil of the playground, which is grassed over; however, horses had been pastured there at least up to within a week or two of the accident, and that seems the probable origin of the spores.

This type of case raises the question of whether anti-gas-gangrene serum should be given with the same regularity as is antitetanic serum in road accidents; but it is probable that most people would consider it an unnecessary expense.

Redruth. L. A. RIDDELL, F.R.C.S.

## Twins with Doubly Knotted Cords

It is well recognized that twins may share one amniotic sac, but the arrangement of the umbilical cords was so unusual in this case that it may be of interest to place it on record.




Mrs. X, a primigravida, was due to be confined on June 5th, 1935, at the City of London Maternity Hospital. On May 29th twin girls were delivered, both having presented by the vertex. Immediately after the birth of the first child the head of the second was seen in the vagina without any sign of the presence of membranes. When the placenta and membranes were examined it was apparent that the placenta was single and showed no unusual characteristics. There was only one amniotic sac, and the cords were arranged as shown in the diagram.

Arising from the placenta was a single thick cord; 1½ in. from the placenta it divided into two cords, one unusually thin, 25 in. long, belonging to the first child, the other of normal thickness, 15 in. long. Four inches from the bifurcation there was a knot formed by the thin cord being looped round the thick one, and also twisted round itself. Three inches further on there was a simpler knot, the thinner cord being looped once more round the other. Both knots were easily loosened, and there were no adhesions between the loops, suggesting that the queer gyrations of the first twin had taken place recently. The first child's condition was precarious at the beginning and it weighed 3 lb. 10 oz. After treatment for shock it improved, and ultimately left the hospital thriving. The second child appeared to make a good start, but collapsed and died after about thirty hours with signs of cerebral immaturity; it weighed 4 lb. 5 oz.

I am permitted to record this case by Mr. R. Christie Brown, and by Mr. J. B. Blaikley, who was present at the delivery, and I acknowledge my thanks to them.

EDWARD FREWER, M.B., B.Ch., D.C.O.G.
Late Resident Medical Officer, City of London Maternity Hospital.

# Reviews

## ENDOCRINOLOGY

Dr. MAX GOLDZIEHER, in his *Practical Endocrinology*,[1] approaches the subject from a new and helpful point of view. Whereas most authors concentrate on the individual glands involved, in this book the leading symptoms which the patient presents are first considered ; from them the diagnosis can be built up. For, as the author rightly says, patients do not come to the medical man with a diagnosis indicating the gland or glands at fault, they come presenting a group of symptoms that demand a diagnosis. But the book is by no means a mere inventory of symptoms. The morphology and physiology of the endocrine glands are first considered in the orthodox way. Then follows a description of the methods of examination of a patient suspected to be suffering from an endocrine disorder. The signs and symptoms are then classified and described under such headings as disturbances of development and growth, disturbances of nutrition, of metabolism, and so forth. We can well understand that the practitioner confronted with a strange case in which some disturbance of this sort stands out as the most prominent feature may gain valuable aid by referring to this book, for there is a not uncommon tendency to leap to the conclusion that a particular gland is responsible for a patient's condition, which leads to an attempt to force his signs and symptoms to fit in with the preconceived notion. It is not until all the leading symptoms are referred to their proper cause that the author touches on treatment at all; and here, as he legitimately can do now, he gives the therapeutic information under the different glands that require treating either for excess or for defect of activity. Though the book is by no means elementary, it is likely to be more helpful to the practitioner who is not well versed in endocrine diseases than many of those written on the usual plan.

We welcomed the first edition of Dr. RIVOIRE's *Les Acquisitions nouvelles de l'Endocrinologie* as one of the most lucid and succinct accounts of the subject we have read. Evidently our opinion of its merits was widely shared, for in less than two years a second edition has been called for.[2] But even that short interval of time has seen many changes in such a rapidly advancing subject as endocrinology, and it is not surprising that the author has found it advisable to recast his material, discarding a good deal which has already passed into the limbo of forgotten hypotheses. But he has added considerably to the chapter on the pituitary, a structure which is becoming increasingly recognized as the master gland of the endocrine system. The new work on the chemical relationships of the sex hormones is also included. Probably only a Frenchman could have accomplished such a complete survey in so small a compass, and perhaps it is only possible to be so clear and concise through the medium of the French language.

## TISSUE CULTURE

*Tissue Culture*,[3] by Mr. E. N. WILLMER, is intended to provide "a summary account of the main advances which have been made in the knowledge of growth and differentiation processes" by the tissue culture method. This little book has been written primarily for the general scientific public, and a non-technical style has therefore been adopted, which makes it delightfully readable.

After considering briefly the general scope and importance of tissue culture, the author gives an account of the characteristics of unorganized growth *in vitro*. This type of growth involves a loss of tissue structure and an active multiplication and amoeboid migration of cells. The physiology of unorganized growth is of great complexity and interest, and the relatively long section devoted to its description and discussion is the best part of the book, as might perhaps be expected in view of the distinguished contributions which the author himself has made to this subject. The latter part of the work deals with organized growth in tissue cultures. In organized growth the cells form tissues with a specific histological structure, and may continue to differentiate and to exercise their normal functions as if they were still part of the body. This means that the tissue culture method can be applied to many embryological and histological studies. The principal achievements of tissue culture in relation to such problems as the factors controlling early embryonic development, the differentiation of the skeleton, and the relationship of differentiation and function, are critically reviewed.

Individual workers are not mentioned in the text, but numbered references to a fairly extensive bibliography are given, a plan which notably enhances the continuity of the writing. A useful glossary of technical terms has been included at the end of the book. It would be too much to expect in such a small volume anything approaching a complete review of the large literature on tissue culture, and many important omissions are inevitable. The book can, however, be confidently recommended to the reader as a stimulating introduction to an interesting subject.

## COMPARATIVE ZOOLOGY

Mr. F. G. S. WHITFIELD and Mr. A. H. WOOD have added another to the long list of textbooks of elementary zoology published in recent years. *An Introduction to Comparative Zoology*[4] is intended to give more prominence than is usual to the comparative and evolutionary aspects of the subject. The arrangement is in some respects novel. Part I consists of a first chapter dealing with general matters, including classification, followed by a survey of the various groups of animals. Among the invertebrates the general features of the group are first described, and this is followed by a detailed account of the type selected for special study. Special attention is given to the groups which are of medical importance. The vertebrates are described with reference to the particular types and no general account is given of the groups. Part I concludes with a comparative account of the embryology of the types studied. Part II consists of chapters dealing with metabolism, heredity, evolution, and oecology. The last is particularly useful in a book of this type, since the attention of the student is directed to the relations between the animal and its environment, with special reference to the factors which limit populations.

It is unfortunate that this book is marred by frequent lack of clarity in description, and, here and there, incorrectness of English. Thus, on page 51, the basal disk of Hydra is described as secreting a substance on to the substratum "adhering the animal to it firmly." There are more typographical errors than there should be,

[1] *Practical Endocrinology. Symptoms and Treatment.* By Max A. Goldzieher, M.D. New York and London: D. Appleton Century Co. Inc. 1935. (Pp. 326 ; 41 figures. 21s. net.)
[2] Paris: Masson et Cie. 1935. (Pp. 306. 36 fr.)
[3] *Tissue Culture. The Growth and Differentiation of Normal Tissues in Artificial Media.* By E. N. Willmer, M.A. London: Methuen and Co., Ltd. 1935. (Pp. 126 ; 11 figures. 4s. net.)
[4] *An Introduction to Comparative Zoology. A Textbook for Medical and Science Students.* By F. G. Sarel Whitfield, F.R.E.S., F.R.M.S., and A. H. Wood, M.A. With a foreword by Major Sir Robert Archibald, C.M.G., D.S.O., M.D. London: J. and A. Churchill, Ltd. 1935. (Pp. 354 ; 141 figures. 15s.)

and mistakes such as "ducti cuvieri" and "caecae" should not occur. There are some errors of fact which cannot be noted here. A short glossary at the end is one of the least satisfactory features of the book, for it contains many mistakes and misleading definitions. The book is provided with numerous illustrations. Most of these are original and many of them good. Others are rather crude, and in these it is difficult (for example, Fig. 108) or impossible (for example, Fig. 126) to distinguish all the structures mentioned in the legend.

The scope and arrangement of the book, considered as a whole, make it regrettable that its usefulness to the student is so much decreased by its flaws. The early stages of the study of any science demand that no trouble should be spared to ensure the utmost clarity of exposition and accuracy of description. If these are attained by drastic revision a second edition of the book will form a useful addition to the literature of elementary zoology.

## THE RHEUMATIC DISEASES

During the last few years many authorities have thought fit to publish books on the chronic rheumatic diseases, and one of the most recent of these is written by Dr. FRANCIS BACH.[5] No doubt this outpouring of literature reflects a healthy increase of interest in an important field of medicine both on the part of the young physician seeking a specialty and on the part of the general practitioner, who presumably sends him cases. There can be no question whatever that the problem of chronic rheumatism calls for a great deal of further research or that a good deal of preliminary work has been done to clear the ground and prepare the way for this future work, but whether enough real progress has been made to warrant such a spate of new books is open to question. It would be unfair to criticize Dr. Bach's book, however, any more than any other of the recently published works, for posing more questions than it answers, and the volume under review deals with the subject quite adequately so far as it goes. Though the subject-matter be very much the same, some readers will prefer the arrangement and exposition of this author, and others that of another, so there is no harm in having several versions of a theme put before the profession for its choice.

In a separate printed slip the author and publishers acknowledge that pp. 42–47 are substantially taken from Mr. Timbrell Fisher's book on *Chronic (Non-tuberculous) Arthritis*, and that pp. 372–3 are substantially taken from *Treatment by Manipulation* by the same author. From both books a number of other quotations are made. It is also acknowledged that the classification in Dr. Bach's book is, in its essential features, that proposed by the Classification Committee (of which the author was a member) of the British Committee on Chronic Rheumatic Diseases.

## ABORTION

The little book with this title[6] is more interesting as an exposition of personal reactions than as a contribution to the difficult study of abortion. Miss STELLA BROWNE, burning with feminist zeal, preaches in the first essay on the text "Ton Corps est à Toi," and would have us admit without cavil that if a woman does not want a baby why should she have one? It almost appears as if she was even reluctant to admit the necessity for the reservations contained in the Russian law that the operation of abortion must be performed by a qualified medical practitioner, in a hospital, and before the third month of pregnancy, though she fully recognizes the dangers and disadvantages of recourse to unskilled abortionists. In the second essay Mr. A. M. LUDOVICI fulminates on the text that the full sexual cycle of women includes pregnancy, parturition, and lactation, for which proposition there is, of course, much to be said. He ignores, however, the effects of civilization and the erect attitude in narrowing the pelvis and making straight paths crooked, and he seems to reach the acme of silliness when he calls upon us to imagine and work for a state of society in which the doctors who advise anaesthetics for childbirth would be stigmatized as the ascetic killjoys of the age. From these polemics it is a pleasure to turn to the short third essay, in which Dr. HARRY ROBERTS sums up the argument and gives us his own sane and balanced view. This, briefly stated, is that there is room for modification of the present state of the law on abortion, but that this operation must be carried out with due safeguards and under proper conditions. There can be few broadminded people who will deny that the whole position is more than ripe for careful consideration, with a view to bringing about reforms which may have to be drastic but must not be ill-considered.

## "ANNALS OF MEDICAL HISTORY"

The last of the six instalments of the *Annals of Medical History*[7] for 1935 covers a very wide span of time. Three articles deal with topics before or shortly after the Christian era. At the other extreme Dr. Arthur MacNalty writes with affection born of personal knowledge of Sir Arthur Conan Doyle, whose real ambition was to be an historical novelist, feeling that detective fiction was on a lower literary level. This may be true as a generalization, but the creator of "Sherlock Holmes" stands supreme in spite of the multitude of imitators. Between the ancient and the extremely modern articles come a group of biographies: Dr. P. E. Bechet of New York writes on James Clarke White (1833–1916), the first professor of dermatology in America, who after all might almost be grouped with Conan Doyle; Professor D. F. Fraser-Harris gives an interesting account of David Samwell, surgeon to the *Discovery*, who was an eye-witness of the murder of Captain Cook at Hawaii in 1779; Dr. Burton Chance sketches the life of William Coward, who was a "candidate" of the Royal College of Physicians, had two of his books burnt by the common hangman as objectionable from a religious point of view, and devoted the remainder of his life more to literature and metaphysics than to physic. Shakespeare's medical knowledge is critically discussed by Dr. Irving I. Edgar of Detroit, and Dr. W. S. Middleton gives a full account of Samuel Jackson of Philadelphia, a prominent teacher in the last century, whose benevolent features appear on the cover of this number. The most ancient of the subjects considered is that of depressed fracture and trephining of the skull by the Incas of Peru, who performed it more frequently than any other nation in the world. Dr. Judson Daland whets the reader's curiosity about the little-known Incas, among whom trephining is said to have been practised twenty-five thousand years ago. Grecian athletic training is described by Dr. Burgess Gordon, and Dr. J. Walsh continues his account of Galen's writings.

[5] *The Rheumatic Diseases. Their Recognition and Treatment.* By Francis Bach, M.A., M.D. London: Cassell and Co., Ltd. 1935. (Pp. 436; 26 figures, 12 plates. 12s. 6d. net.)

[6] *Abortion.* By F. W. Stella Browne, A. M. Ludovici, and Harry Roberts. London: G. Allen and Unwin Ltd. 1935. (Pp. 143. 4s. 6d. net.)

[7] *Annals of Medical History.* New Series, vol. vii, No. 6, November, 1935. Edited by Francis R. Packard, M.D. New York: Paul B. Hoeber, Inc.; London: Baillière, Tindall and Cox. (Pp. 503–599; illustrated. Volume of six numbers, £2 10s.; single numbers, 10s. 6d.)

## Notes on Books

The publication of a second edition of *The Invertebrata*, by L. A. BORRADAILE, L. E. S. EASTHAM, F. A. POTTS, and J. T. SAUNDERS (Cambridge University Press, 25s.), is welcome, for this book supplies a definite need. Before its first appearance in 1932 there was no recent textbook giving such a concise and comprehensive account of these groups of animals. There are two great improvements in the new edition. The chapter introducing the Metazoa has been rewritten and extended. It now gives the student a brief but excellent survey of the types of structure encountered in this sub-kingdom, and lays emphasis on the importance of physiological considerations in relation to comparative anatomy. The second major alteration is that the chapter on the Insecta has been lengthened from sixty to eighty-nine pages. This has allowed a more extensive introduction, in which an account of the recent developments of the physiology of the group is given. The larger orders are also more fully described. These chapters somewhat reduce the lack of balance in the first edition, in which about one-sixth of the book dealt with the protozoa. The Nematoda are of such importance from every point of view as to entitle them to more than the somewhat paltry allowance of thirteen and a half pages in a book of about 700 pages. The Nematomorpha and the Acanthocephala find a place for the first time, but they are hardly dealt with, since only two and a half pages are devoted to the two phyla. Surely if they are worth describing at all they are worth describing at somewhat greater length, especially as, in the Acanthocephala at least, the text does not completely elucidate the illustration. These are, however, matters of detail and of opinion. The book forms a most useful survey, and the improvements are such that students may be recommended not to buy second-hand copies of the first edition.

Professor ROBERT DEBRÉ's little work on the *Treatment and Prophylaxis of Diphtheria* (Paris, J. B. Baillière, 12 francs), which forms the latest contribution to the series known as *Les Thérapeutiques Nouvelles*, contains a concise account of the history, mode of production, and clinical aspects of anatoxin and the general treatment of diphtheria, as well as a brief description of immunization, to which the author has devoted a more important work. Clinicians in this country will be surprised to learn that Professor Debré still regards the subcutaneous method as the best mode of introduction of antitoxin, and that after a few trials he has abandoned the intravenous route.

We have received a copy of the Spanish translation of the third edition of Professor J. W. BIGGER'S *Manual of Bacteriology*,[8] of which the original received notice in these columns in 1932. The translator, Professor Emilio Zapatero Ballesteros, who holds the chair of hygiene and microbiology at Valladolid, has proved a faithful interpreter.

The book entitled *Those were Good Days* gives us the reminiscences of the late distinguished German surgeon, CARL LUDWIG SCHLEICH, in an excellent English version by Mr. Bernard Miall (George Allen and Unwin, 12s. 6d.). After several chapters dealing with his childhood, which include a description of his father, an eminent ophthalmologist in his day, the autobiography affords a lively account of his medical training, under such eminent teachers as Graefe, Virchow, Dubois-Raymond, and Ehrlich. The method of infiltration anaesthesia, for which Schleich is best known, had a very unfavourable reception when he first described it in the Berlin Surgical Society, and it was some time before it received due recognition. Surgery, however, was only one of the many activities of this versatile man, who was also a poet, a musician, and a painter, and an intimate friend of August Strindberg the dramatist and Richard Dehmel the poet, to each of whom a chapter is devoted. A sympathetic sketch of the author by Wolfgang Goetz forms the epilogue to the work.

[8] *Manual de Bacteriologia para estudiantes y medicos*. By Joseph W. Bigger. Translated by Dr. E. Z. Ballesteros. Barcelona: Manuel Marin. 1936. (Pp. 474; 84 figures. 20 pesetas.)

Under the title of *The Biology of the Individual*[9] the Association for Research in Nervous and Mental Diseases has placed on record the proceedings of its fourteenth annual meeting. Its programme attempted to evaluate the various factors which make up individuality and personality—a somewhat ambitious effort. The first part deals with fundamental aspects such as heredity, growth, environment, and various problems of constitution, while the second treats of the psychological and sociological aspects of the question. Dr. Smith Jelliffe opens the ball with a somewhat discursive paper on constitution and individuality, which does not throw much light on the subject, but most of the other contributors—such as Drs. Llewellys Barker, Walter Timme, Max Goldzieher, Macfie Campbell, and George Henry—do at least attempt to get to closer grips with their respective topics. Probably they all felt, as the reader must, that it is almost impossible to give more than just a stimulating suggestive talk on such a diversity of subjects—and this, at least, some of them have achieved.

In his *Short History of Talmudic Medicine*,[10] which forms the latest addition to the Short History Series, Dr. J. SNOWMAN gives a concise account based on the works of Julius Preuss and M. Pearlman of Jewish medicine during the period extending from A.D 200 to 600. The subjects discussed include the social status of the physician, contemporary anatomy and physiology, theories as to the causation and cure of disease, surgery, gynaecology, obstetrics, paediatrics, disease of the eyes, teeth, ears, and nose, skin diseases, and comparative pathology.

The work entitled Morals and Prostitution,[11] by MARCEL ROGEAT, in spite of its claim to rank among the important social investigations, is merely a plea on behalf of the tolerated house and the French system of the regulation of prostitution, which the author regards as superior to that of any other country.

[9] Baltimore: Williams and Wilkins Company; London: Baillière, Tindall and Cox. 1934. (Pp. 323; 48 figures, 21 tables. 27s.)

[10] *A Short History of Talmudic Medicine*. By J. Snowman, M.D., M.R.C.P. London: John Bale, Sons and Danielsson. 1935. (Pp. 94. 3s. 6d. net.)

[11] *Mœurs et Prostitution*. By Marcel Rogeat. Paris: Nouvelles Editions Latines. 1935. (Pp. 354. 10 fr.)

## Preparations and Appliances

### MULTIVITE PELLETS

Multivite Pellets (British Drug Houses Ltd.) contain a mixture of vitamins A, $B_1$, $B_2$, C, and D in high concentration and in small bulk. The chocolate-coated pellets weigh 2½ grains, and each pellet contains:

| | | |
|---|---|---|
| Vitamin A | 3,000 | international units |
| Vitamin C | 100 | ,, ,, |
| Vitamin D | 600 | ,, ,, |

Vitamins $B_1$ and $B_2$ the equivalent of 31 grains of fresh yeast

The fact that it is possible to prepare such a concentrate on a commercial scale is striking evidence of the great strides that have been made in recent years in the field of vitamin chemistry. The pellets have a pleasant taste, and will be taken readily by children. They are intended for use in cases of multiple vitamin deficiency.

### BLAUD PILL WITH COPPER

Tabloid Blaud pill and copper (Burroughs Wellcome and Co.) are sugar-coated tabloids containing 10 grains Blaud's pill (about 1 grain iron) and 1/100 grain copper sulphate. Recent research has shown that minute quantities of copper are essential for the formation of haemoglobin, and in some cases of anaemia for which iron therapy is prescribed there may be a copper deficiency as well as the iron deficiency, and hence a combination of the two metals may be indicated.

### A PINE-OIL GERMICIDE

"Hewsol" is a pine oil with a high bactericidal power; it is marketed by C. J. Hewlett and Son, Ltd. The Rideal-Walker carbolic acid coefficient is 5. The oil has a pleasant odour, it forms a fine emulsion when mixed with tap-water, and is non-irritant. It is recommended as a general disinfectant in medical and surgical practice.

# CLINICAL MEDICINE

## A FAREWELL LECTURE AT ST. BARTHOLOMEW'S HOSPITAL

BY

LORD HORDER, M.D., F.R.C.P.

In place of the customary "Gentlemen" with which these lectures are prefaced, I am to-day privileged to address you as "Colleagues and gentlemen." The compliment paid to me by the presence of so many of my fellow teachers is both graceful and touching. It is also, as compliments are wont to be, expensive, since the occasion which determines it costs me a great deal. Swan songs are prone to be sententious—a quality which I always try to avoid, whether in speech or in action. Personalities I dislike just as much as I dislike sententiousness. I will allow myself one brief deviation from my practice in respect of each of these two antipathies. I admit that if, after all these years, I have no sort of message for those who follow me, I should feel heartily ashamed. I also admit that this, my last clinical lecture at Bart's, far from leaving my withers unwrung, strains them to their utmost.

The occasion justifies a departure from custom in regard to these lectures. To-day I am not bringing before you a "difficult case," unravelling its complications as best I can, and trying to make clear the mental process by which this may be done—and thereby invite that drowsiness which, in these circumstances, tends to steal over my audience (pardonable only in the case of my house-physician, for has he not already been "bored stiff" by my previous rehearsals in the ward?). Nor am I bringing a more simple case, which may be taken as a peg upon which to hang a list of causes or symptoms of disease, and thereby stimulate those who scent the possibility of something which is of potential use in another place—a stimulus which extends at times even to a little hurried note-taking (for I have never misconstrued this brief spurt of active, rather than passive, attention on the part of the less frugal-minded of my audience). Instead of doing either of these things I propose to say something about clinical medicine itself—that is, about that part of the physician's work to which these lectures are a running commentary.

### Functions of the Clinician

Whatever may be the special branch of medicine that attracts us, it is commonly accepted that it is at the bedside where, on the one hand, the vital expressions of diseases are manifested, and where, on the other, the contributions made by the laboratory, both to diagnosis and to therapy, must eventually be tested. "Les malades, toujours les malades." But medicine provides such a large field for human interest and activity that there are many points at which a man may branch off into a whole life's work of relatively detached scientific effort. Any one of these digressions may take him so far away from the patient that, quite joyfully and quite successfully, he may make valuable contributions to what becomes, in effect, pure science. He may then be tempted to consider clinical medicine but a poor affair, scarcely worth the pursuit of a trained intelligence. Whereas I regard it as a very inviting field for the most highly cultivated minds—a field in which meagre achievement, far from indicating an essential poverty in the soil that is being tilled, signifies only that the husbandman is not always as alert and well equipped as he might be. However, what I say this morning is not intended as an apologia for the clinician so much as a brief survey of his place in medicine, and how his functions are, in my judgement, best performed.

In the view of some people the clinician has not advanced or developed proportionately with those of his colleagues who are primarily concerned with the ancillary subjects of surgical technique, bacteriology, and biochemistry. I cannot accept this estimate, and I think it is due to a false, or a forgotten, conception of the clinician's function. Though this remains what it fundamentally always was—the collection and evaluation of all available data which are pertinent to the diagnosis and the treatment of the sick person—I believe that the growth of the means by which this function is achieved has been even greater in the case of the clinician than in the case of any one of his colleagues, for the reason that the whole of their combined knowledge is available for him if he is familiar with it and cares to use it.

In my own time I have witnessed three great advances in the science and art of clinical medicine, and (though "I speak as a fool") these advances have seemed to me to make the clinician of much greater potential service to the patient than he was before they took place. How much he is actually of greater service depends upon himself and the degree to which he has absorbed these advances and transmuted them into his practical work.

The function of the old clinicians was not inaptly termed "walking the wards," an expression which has its modern counterpart in "going round." Our predecessors made large observations rather than small, and they acquired a facility in diagnosis and in prognosis which seemed to many quite uncanny. This facility was really due to the fact that they had trained themselves to make a greater number of observations than they were actually aware of. Their eyes and ears and touch and smell were unaided by instruments of precision, and the pitch of excellence to which their senses perforce—and at long last—arrived was very astonishing. But their exactness stopped short at the point where their unaided senses could pierce the mystery no further, and this in many cases was stopping too short to enable them to give the help which the patient needed. For example, septicaemia was only septicaemia, and heart disease, for the most part, was only heart disease.

### Three Great Advances

Then came the first great advance. With the increased frequency of, and greater thoroughness in, post-mortem examinations, the clinician began to "think morbid anatomically." This was a notable move forward. He was able to visualize the diseased organs as they actually existed during life, and this visualization gave his clinical methods a clearer purpose and direction. This habit of correlation of the clinical features of the case with post-mortem experience remains, and must of necessity remain, one of the most valuable aids to diagnosis and prognosis. The clinician who relaxes in a punctilious attendance at the post-mortems upon his patients, or upon patients of his colleagues, thinking the time could be better spent in the wards or in the out-patient rooms, is not only denying himself the chief correction to his exuberance and to his vanity, he is departing from the bed-rock of medicine itself. What he says at the bedside may or may not be the truth; what he sees in the post-mortem room *is* the truth. In this connexion I should like to enter a plea against too much reservation of post-mortem material for deferred examination. Some such reservation is at times desirable and even necessary, but it should be upon the decision

of the pathologist and of the clinician jointly, each having regard to the claims of the other. Be it remembered that diseased organs that are opened at the time of the post-mortem examination, and are seen in relation to the rest of the body, nearly always throw light upon the obscurity that has perhaps been in the minds of those who have seen the "case" during life; whereas organs that are dissected by the aid of the pathologist's midnight oil may or may not illumine his own individual darkness.

The second advance came with the development of laboratory methods, since in these the clinician found new and invaluable aids to his work. The study of the patient *qua* patient was supplemented by the study of materials derived from the patient. Thus we saw the birth of clinical pathology. The past thirty years have witnessed this lusty babe grow up to a vigorous manhood. As is wont with the virile adolescent, there have been times when he thought himself more important than he really was, when he sought to bestride the whole world of medical knowledge, when he firmly believed he *was* medicine rather than merely making his contribution *to* medicine. His incursion into the sick-room was apt to be somewhat brusque, not to say at times truculent. Cuckoo-like, he jostled and pushed and ofttimes succeeded in ousting his more timid and gentle colleague from the latter's legitimate sphere. He took to describing himself in the telephone directory as "physician," and he invited the credulous sick to consult him. The public, with its child-like confidence in machinery, loved him, welcoming his advent as signalling the millennium of exact medicine, and unaware that the human brain is the best machine of all. A catalogue of the flora of the fauces and/or of the faeces, a complete blood count, a chemical analysis of the urine to the third place of decimals: "What further may be sought for or declared?" Not only was the new gospel about to dispel the darkness that shrouded diagnosis, it was about to illumine the therapeutic field also. The "opsonic index" for the exact diagnosis, the hypodermic syringe, charged with the appropriate antigen, for effective treatment, and medicine was "taped" at last. The clinician came to be regarded by some with amused tolerance; by others, even less generously minded, as obstructive to real progress. Nosology disappeared and pathology contracted down to the name of the infecting agent: patients no longer suffered from diseases but from micro-organisms. "What is the matter with the man in Bed 4?" "T.B." . . .

But fortunately for the patient, for whom, like the soul of Faustus, the powers of good and evil were fighting, some clinicians kept their heads. They absorbed what was good in these clinico-pathological advances, seeing in them important supplemental aids to their methods rather than a substitution for them. But the older and cruder notions of infection had to be entirely revised, and gaps in the knowledge of metabolism had to be filled. Not only was it necessary that the clinician should think morbid anatomically, it was necessary that he should think bacteriologically and biochemically also.

Then came the third great advance, and by means of an entirely new tool. I refer to the arrival of roentgenology. Though useful from the first, it has taken a good many years to improve the technique and get the method under control, but to-day there is probably no more useful addition to the clinician's methods. The exercise of forbearance in interpretation on the diagnostic side and moderation in claims on the therapeutic side has become an important part of the clinician's work.

## Essential Clinical Data

I said just now that the fundamental function of the clinician is to collect and evaluate data. But what data? The clinician is not a *mere* collector of data. If he were, diagnosis would be as easy for one man as for another. Nor his he a mere recorder of cases seen. If he were, the palm would go to the panel practitioner or to the junior casualty physician, though this consideration waives a fact with which we are well aware—that it is possible, nay easy, to see a great number of patients and yet not see their diseases. It is the *essential* data that we want, not the unessential. It is data that are associated, not data that are dissociated. The capacity to neglect is as important as the capacity to take notice. True, the more obscure the case the less we can afford, in the first survey, to omit any examination; but after a time there comes what may seem to some an almost astounding negligence. This is not forgetfulness, nor a lapse from good methods: *it is the ability safely to omit*. Patients' dossiers are apt in these days to be so full and so heterogeneous that the courage to say of some of the reports, "Noted, nothing doing," is often the first step in the elucidation of the problem. It falls to the clinician alone to become familiar with the range of health, to be sensitive to what lies within it and to what lies outside it. The exercise of this sensitiveness in any particular case becomes more and more essential the more meticulously exact the reports of the experts may be. And these reports tend to be more and more meticulously exact with the increasing tendency to specialism and the myopia which goes with it. The number of patients whose hearts are healthy is in inverse proportion to the number of cardiologists they consult and the frequency with which they are "electro-cardiographed." An upper respiratory tract which is passed as "normal" by a careful "nose and throat man" will soon be so rare as to merit demonstration at the Royal Society of Medicine.

It has been during the recent period of intensive laboratory investigations on the clinico-pathological side of diagnosis that the notion has arisen that the clinician's observations are not really scientific, that they are of the nature of guesswork, whereas everything that happens in the laboratory is controlled by the infallible rules of logic. The test tube and the microscope cannot lie. But God alone knows if what the physician thinks is an enlarged spleen *is* the spleen; or if rose spots are not "any old spots"; or the association of a soft and infrequent pulse with a continued high fever is not some odd trick of Nature designed to intrigue the curious-minded; and why should not a week of intense headache pass away somewhat suddenly and be replaced by a muttering delirium; and an unexplained deafness appear? Funny things like these do happen to people who suffer from a disease of microbic origin. But the one certain thing is that the disease isn't typhoid fever or any infection in the T.A.B. group because there is no agglutination of the laboratory stains of those organisms by the patient's serum. Strange, this idea that facts have a different value according as they are observed at the bedside or in the laboratory. Stranger still, the idea that one negative observation in the laboratory should, by responsible clinicians, be regarded as more important than six positive observations at the bedside. "We can never, by a single experiment, prove the non-existence of a supposed effect." If "science arises from the discovery of identity amidst diversity," then it matters not if the identity be discovered by careful observation of the patient clinically or pathologically. The whole question is, Is it a *true* identity? But this, in the last resort, depends upon the critical judgement of the observer. Granted that the exercise of judgement at the bedside is more difficult than it is in the laboratory, mistakes in judgement are not confined to the bedside. We have only to send a specimen of the same stool to two, or even to six, bacteriologists, equally expert, to find that failure to "discover identity" is by no means only a bedside difficulty. Here the question of criteria is involved, as we know, and criteria are

not always uniform even among laboratory workers. Their results are therefore, of necessity, not always comparable. Now the clinician's criteria are in general less exact than the pathologist's, nor can they be made so exact very easily ; but if they are made severe, as they should be ; if nothing is termed positive which is only doubtfully positive ; if the clinician's judgement concerning his observations is controlled by reliable technique ; if discovered identities are unequivocal: then his " facts " are as scientific and as logical as are those of the pathologist. The truth is that clear thinking, with forbearance, is essential to the satisfactory solution of a diagnostic problem, whether the contribution comes from the laboratory or from the bedside.

There is a technique of the mind as well as of the eye and of the hand, and the former is quite as essential as the latter. It is not only what you find *at* the bedside, it is also what you bring *to* the bedside. The eye sees what it takes with itself the power of seeing: it is the *mind* that sees. And surely it is the same in the laboratory? In both spheres there comes to some—slowly, painfully, towards the end (alas!)—facility born by patient practice out of time. Clinician and pathologist are more akin than they sometimes realize. Each of them takes a pride (which the other regards as excessive) in his small discoveries, and each of them lacks humility (or so the other thinks) in face of the certain fact that every day, whether it be in the ward or in the laboratory, momentous things are happening under their very eyes, yet they see them not, for they are both under the same ban—they cannot live out of their generation.

If, looking back, I can feel satisfaction with any modest effort of my own in the diagnostic field, it is in opposing the tendency of the past two decades towards the divorce of clinical from laboratory methods. In this hospital this divorce has really never occurred. Kanthack and Andrewes and Gordon and Kettle and Canti have been too wise not to see that pathological processes have a unity which centres itself in the patient, and that without careful study at the bedside only one part of these processes can be elucidated. It is the close co-operation of both observers, and this alone, that can lead to results that are helpful. We at Bart's have been fortunate in this matter, and I hasten to add that any mild strictures of mine refer not to our school but to a part of the greater world of medicine outside.

But clinical medicine in this greater world is just now coming back into its own. The prince has taken notice of the neglected charms of our modest Cinderella. A marriage is being arranged. Professors are leading her to the altar, and the name of her bridegroom is Research. There is just time for me, as an interested and loving uncle, to give the pair my blessing.

> " Let me not to the marriage of true minds
> Admit impediments. Love is not love
> Which alters when it alteration finds,
> Or bends with the remover to remove:
> O, no! it is an ever fixed mark
> That looks on tempests and is never shaken ;
> It is the star to every wandering bark,
> Whose worth's unknown, although his height be taken."

And so is resumed afresh the long line of clinical observers which has been lit by the genius of Hippocrates, of Sydenham, of Trousseau, of Osler, and of many others—masters in clinical research.

## Clinical Teaching

A few words about clinical teaching before I close. Time has not led me to change my view that the best help the clinician can give his pupils during the early part of their career is to insist that they use their words carefully, exactly, and without ambiguity. Next to this, but only by means of this, he can help them to think clearly. This is important, too, for as Thomas Hobbes said: " As men abound in copiousnesse of language ; so they become more wise, or more mad than ordinary." I may be forgiven for repeating myself and saying that the first textbook of medicine should be Jevons's *Primer of Logic*. It costs one shilling but is worth untold gold. Note-taking must never be scamped. What is written about the facts of a case demands the same care as what is said about them. If to these things can be added a thorough drilling in methods of clinical examination we have really accomplished a great deal in the first three months. Be it never forgotten that to watch the teacher's own methods is of greater help in the earlier stages of clerking than to try and understand what he is talking about. Efforts to teach medicine, however tempting, should be resisted. The keen student will teach himself medicine if he is properly trained in these important preliminaries.

I wish something could be done to save the clerk's valuable time in the wards by introducing into the pre-clinical studies a number of examinations and methods which have really to do with anatomy and physiology. I have often dealt with this matter, but I make no excuse for referring to it again. The fundus oculi and the membrana tympani are normal anatomical structures, yet few clinical clerks have ever seen them before they enter the wards and, largely as the result of this fact, some have not seen them clearly even when they leave. We could profitably exchange the time spent over theories of colour vision and the intimate structure of the organ of Corti for these important matters. The blood cells are a part of normal histology but they have rarely been counted, or, if they have, it has only been during the demonstration of the Thoma-Zeiss pipette. The contours of the abdomen, the reflexes and tendon-jerks, a man's normal gait, the surface markings of the lungs, the deposits that may occur in urine apart from disease, the flora of the faeces in health . . . is it really economical that the time of the clinicians—and of the senior clinicians—should be taken up in teaching about these things? Mr. Dean, we have praised you, though not more than you deserve, on account of the magnificent laboratories and equipment which you have assembled on the Merchant Taylors' site. Here is another piece of work for you and your colleagues—this adjustment of the pre-clinical studies so that they conform more to the requirements of men who are going to be doctors, and valuable time may be saved for the later years of the curriculum.

## Conclusion

Well, I must bid you good-bye. It has all been, in schoolboy phraseology, " great fun," and I have thoroughly enjoyed it. The clinician's material has not been confined to the patients in their beds. For there have been the clerks themselves . . . and the rest of the " firm " . . . and the nursing staff . . . and the porters whistling outside the ward, under the echoing shaft of the lift . . . and the buzzer that calls for the anaesthetist who is never there . . . and this lecture theatre. More than all this, there has been the world outside—the domestic circle, the market place, the forum. There has been the whole human comedy as seen by Shakespeare and Molière and Cervantes and the other great clinical observers. I hope I have not put too many of you, whom I have been privileged to teach, out of your stride. I trust my methods and my teaching have conformed in some measure to the great traditions of this place. But they have been largely, and of necessity, myself—

> " ay, there's the rub."

So now I doff my ward coat and hand it to you, Evans, my friend. Gow and you have been loyal, inspiring, and very charitable colleagues, and I tender you my most sincere thanks. God bless you, and God help you!

British Medical Journal

SATURDAY, JANUARY 25th, 1936

# KING GEORGE AND MEDICINE

Our profession, with every other section of the community of peoples that make up the British Empire, mourns the passing of King George V, and pays its tribute of love and respect to the memory of a good and truly noble man whose guiding motives were duty and self-sacrifice. What King George meant to his people was abundantly proved eight months ago, and what he felt towards them he expressed in simple, heartfelt words on Christmas Day. The Jubilee celebrations, and the last and most moving of the four broadcast messages from Sandringham, brought him and millions of us together in a common emotion—not of "Monarch and subjects" so much as of "father and family." Sharing these feelings with everyone else, and remembering the long and grave illness when the King's life hung in the balance seven years ago, medical men and women read with deep misgiving the first bulletin on Saturday, January 18th. They feared the worst, because the lessons of their daily work told them that little short of a miracle could preserve the King.

His late Majesty became an honorary member of the British Medical Association in 1903, thus following the example of King Edward VII, who had accepted honorary membership in 1900. The Annual Meeting of 1903 was held at Swansea, and the new Prince of Wales acknowledged a telegram from the members there assembled by saying that he felt very proud to have been elected, and wished the Association all prosperity. When the certificate of honorary membership was handed to him by the Chairman of Council in March of the following year he showed much interest in the aims of the Association, particularly inquiring about the scientific work and the funds available for it. Soon after he came to the Throne in 1910 he became Patron, in succession to his father. Many will remember the occasion in July, 1925, on which King George opened the new House of the Association, accompanied by the Queen; the claim was made in these columns that so signal a compliment might be described as a landmark in medical history. In his reply to the address presented to Their Majesties, in the Great Hall at Tavistock Square, the King said that he had always taken a sincere interest in the science and the practice of medicine and surgery, and was proud to have succeeded his father as Patron. He commented on the remarkable increase in membership and usefulness of the Association and the high standard of professional practice and ethics it guarded. The Association was naturally second to none in its anxiety and sympathy at the time of the King's very severe illness and in the rejoicings with which his Silver Jubilee was celebrated last May. On the latter occasion it presented an address of loyal congratulation illuminated in burnished gold and colours on a vellum scroll wound round an ivory rod. Authoritative accounts of the illness and of the King's gradual progress towards recovery appeared week by week in the *British Medical Journal* in 1928–9.

King Edward VII had shown much interest in the services rendered by hospitals, and his son early succeeded to many of his father's positions in the voluntary hospital world. In 1901 the then Prince of Wales was installed as President of St. Bartholomew's Hospital, a position held by his father for thirty-four years. In the summer of 1902, accompanied by the Princess of Wales, he opened the new Nurses' Home at Guy's Hospital, of which he was also President. The new block of St. Bartholomew's Hospital was also opened by the Prince and Princess of Wales in 1907. Another important medical charity in which our late King manifested an interest before his accession to the Throne was the Royal Medical Foundation of Epsom College. An appeal was made early in King Edward's reign with the object of placing the benevolent side of the work on an assured basis. His son took the deepest personal interest in this appeal, presided at the festival dinner, and paid a special visit to the College. He was able to announce an addition of £6,500 to the College's resources. At the festival dinner he assured the medical profession that it might ever rely on his and his family's hearty sympathy and ready support in its work. He made an eloquent appeal for funds, saying that he felt he was uttering a mere commonplace in stating that everyone owed a debt of gratitude to the doctor and no one could get on without him: the debt was not one that could be discharged when a bill was paid. By this time His Royal Highness was President of five of the large London hospitals and also of the King Edward's Hospital Fund for London. He became an honorary Fellow of the Royal College of Surgeons of England in 1909. When he ascended the Throne in the following year this *Journal* welcomed him on behalf of the British Medical Association, and remarked that he had often astonished members of medical and administrative staffs by his minute and accurate

acquaintance with the details of scientific management of a hospital.

In 1912 King George indicated his concern for the progress of tropical medicine by sending a personal contribution to the Lord Mayor's Fund on behalf of the London School of Tropical Medicine. Throughout the four years of the war both the King and the Queen maintained a constant and most helpful interest in the medical and surgical care of the troops, never sparing themselves in this task of practical sympathy. During a tour of the West Country in 1915 the King told the Mayor of Torquay that he had paid visits to over a hundred military hospitals and regarded himself as something of an expert. He visited many hospitals and casualty clearing stations in the war area, and spoke warmly of the good organization, skill, and gentleness of the staffs; and it was on the ill-fated hospital ship *Anglia* that he returned to England from France after an accident near General Headquarters in the latter part of 1915.

Delegates to the International Cancer Conference in 1928 were received by the King at Buckingham Palace and welcomed in a characteristic speech emphasizing his interest and sympathy in their work. In 1935 the King and Queen opened the British Post-Graduate Medical School at Hammersmith, the King remarking:

"I am especially glad of this opportunity to show my gratitude for the skill and care which I and my family have received from members of this profession. . . . It is my earnest hope that this School with its happy union of ward and laboratory, university and local authority, drawing students and teachers alike from all parts of our Empire, may prosper under God's blessing. May it play an Imperial role in the winning and dissemination of medical knowledge and in the relief of suffering amongst my people in this country and over-seas, and in enabling the doctors of all lands to come together in a task where all must be allies and helpers."

We may truly say of King George V that throughout the whole of his public life he was a faithful and discerning friend of medicine and of medical charity, using the latter term to include both the voluntary hospitals and allied institutions and the cause of professional benevolence. With Queen Mary he visited the sick and wounded on countless occasions, and by personal study he acquired a sound general knowledge of hospital construction and administration. He recognized that progress in the healing art requires proper education in preventive and curative medicine and proper facilities for research and the dissemination of knowledge Like a wise father, the Patron of the British Medical Association acted on the principle of trusting the doctor and encouraging the doctor to do his best.

## THE PARATHYROIDS IN HEALTH AND DISEASE

The parathyroids are probably the smallest known endocrine organs in the body. In different species of animals they vary in number and position; in man there are usually four glands, two on each side, in close relation to the posterior surface of the thyroid gland. Though discovered over fifty years ago the true significance of their secretion and their relation to others of the endocrine system is only now being determined. In an interesting monograph[1] Dr. Shelling, who has himself contributed to our knowledge of the subject, points out that in 1885 Victor Horsley gave accurate accounts of the symptoms following thyroidectomy—an operation by which the parathyroids also were removed. Horsley attributed differences in symptoms in different species of animals to the dietary habits, and was apparently the first to appreciate the metabolic factor in this disturbance—a fact which is now fully recognized. The discovery by MacCallum and Voegtlin in 1908 of a reduction in the levels of blood calcium in parathyroprivic animals opened a new approach to the study of parathyroid physiology. It was not until 1924, however, that successful attempts were made to prepare an extract of the glands, and since then numerous researches have been concerned with the effects of the extract on various systems, organs, and fluids of the body.

From the point of view of pathology the most important change in these glands is enlargement, due to hyperplasia, adenoma, or malignant growth. Experimental physiologists have been occupied in determining the complete or partial impairment of function following extirpation; replacement therapy after hypofunction has been established; and the production of a state of hyperfunction. The phenomena have been paralleled in patients, so that we owe much of our knowledge of the parathyroid to experimentalists and keen observing clinicians. In the parathyroprivic man or animal there is an important alteration in the metabolism of phosphorus and calcium, especially the former. It would appear that there is an inability to excrete the excess phosphorus in appreciable amounts by way of the urine. Other means are required which aid in the excretion of the retained phosphorus or prevent its accumulation. The most efficacious methods of preventing phosphorus retention are (1) the addition of substances which produce a phosphate diuresis—sodium chloride, glucose, acids; (2) the addition of cations which facilitate the excretion of phosphorus in the faeces—calcium, strontium, magnesium; (3) the limitation of the phosphorus intake. In parathyroid tetany the phosphate retention and the hyperphosphataemia may be the

[1] *The Parathyroids in Health and in Disease.* By David H. Shelling, M.D. H. Kimpton. (25s.)

primary result of the lack of parathyroid function, and the hypocalcaemia and the tetany merely due to the phosphate retention. The irritability of the nervous system responsible for the symptoms of tetany is probably peripheral rather than central.

The most important sign for the diagnosis of tetany is Erb's phenomenon, an increased reaction to minimal galvanic currents, though many recent observers hold that the diagnostic factor is not the intensity of the current required to elicit a reaction but the time interval between the stimulation and the response (chronaxia). There is also an increased irritability of nerves to mechanical stimuli, as the facial (Chvostek's sign) and peroneal. The characteristic obstetrical position of thumb and fingers may occur spontaneously or be elicited after stopping the circulation of the upper limb temporarily. But the most useful and reliable sign is diminished concentration of calcium in the blood serum. Tetany follows a reduction in the total concentration or inactivation of part of the calcium of the serum, and may occur in other conditions than hypoparathyroidism. Rational treatment depends upon an understanding of the metabolic changes. It is important to reduce the phosphate retention and increase the calcium of the serum. Calcium administered by mouth, or as chloride or gluconate intravenously, together with low phosphorus intake, and parathyroid hormone intramuscularly or subcutaneously, are the staple methods ; magnesium or ammonium salts and dilute acids are also used. Transplantation of parathyroids would seem the most logical method, but it presents technical difficulties that are not yet surmounted.

Though osteitis fibrosa has been known for upwards of seventy years the association between the lesions in the bones and hyperparathyroidism was much more recently recognized. The diagnosis of an advanced case of von Recklinghausen's disease is comparatively simple. The concentration of calcium in the serum, normally about 10.5 mg. per cent., may be as high as 12.5–29.4 mg. per cent. ; while the inorganic phosphate, normally 2.5–5.5 mg. per cent., may be as low as 1.5 mg. per cent., and the serum phosphatase is much increased. Lumps may be felt on the bones, and *x* rays will demonstrate widespread areas of osteoporosis, giant-cell tumours, and well-defined cysts. High calcium and high phosphorus diets, with or without vitamin D or heliotherapy, have been used in the treatment of hyperparathyroidism, but the general results are rather disappointing. Parathyroidectomy is indicated, but the chief operative difficulty is to locate the tumour, and multiple parathyroid tumours may exist. The majority of patients with generalized osteitis fibrosa have benefited from parathyroidectomy ; indeed it is a specific remedy for the alleviation of primary hyperparathyroidism. In a final chapter Dr. Shelling discusses the use and misuse of parathyroid hormone and of parathyroidectomy in conditions other than those of hypoparathyroidism and hyperparathyroidism respectively, and writes wise words which may prevent the use of these measures in states in which no good and much harm may be done.

## VIVE LE ROI

In the name of the British Medical Association and of the medical profession of this country we join with all loyal subjects in offering homage to the new Sovereign. Like his father, King Edward VIII has always taken an active interest in the work the medical profession performs day in and day out for the relief of human suffering and for the betterment of the health of the people. Those who were present at the Centenary Dinner of the Association in 1932 may recall with a certain poignancy the words which he then uttered as Prince of Wales:

> "The doctor is certainly our first friend in life, and is probably also our last. He is a very good friend indeed. I am glad to have the opportunity of expressing my abiding interest in, and admiration and sympathy for, the medical man in practice."

This sympathy with the "man in practice" is characteristic of our new King, who on so many public occasions has shown himself ever ready to pay tribute to the private individual symbolized in the public event. Appreciative as he has been of the work of the voluntary hospitals and of the private practitioner, King Edward VIII has at the same time recognized the need for organized medical services for those whose purse is short, and the necessity for insurance against sickness. As President of King Edward's Hospital Fund he lent his support to the British Provident Association and the Hospital Saving Association. "The goal of all those who interest themselves in health questions will only be reached, I think, when every member of the community can obtain the full advantage of wise and practical preventive medicine, and, when necessary, of home or hospital treatment, medical and surgical, of the most skilful kind available, and at a cost in keeping with individual and family needs. Insurance against sickness would seem to be the only way for people of limited means. . . ." This and other utterances are those of a wise and benevolent counsellor, who has at heart the needs of the people and in mind the problems that beset medical practice in this the first year of his reign. Long may he live.

### VACCINATION OF INFANTS WITH B.C.G.

J. D. Aronson and A. M. Dannenberg[1] have carried out a carefully controlled experiment on the vaccination of infants with B.C.G. Between December, 1927, and October, 1934, forty-three white and twenty-seven coloured infants were given a total of 30 mg. of B.C.G. vaccine by the mouth during the first ten days of life. As controls, 114 white and fifty-three coloured infants were chosen. Observations on the infants were made as far as possible at three-monthly intervals during the first year, and at six-monthly intervals subsequently. In considering the results the infants were divided into three groups according to the risk of exposure to tuberculous infection. The first group were exposed to contact with persons containing tubercle bacilli in their sputum. Of forty-one vaccinated children in this group, with a mean age of 31.4 months at the time of the last examination, only one died of tuberculosis, while of eighty-four control children, with a mean

[1] *Amer. Journ. Dis. Child.*, November, 1935, p. 1117.

age of 40 months, ten died of miliary tuberculosis. The second group were exposed to contact with tuberculous persons having a persistently negative sputum. Of fifteen vaccinated children in this group, with a mean age of 28.3 months, none died, while of forty-five control children, with a mean age of 39.3 months, two died from tuberculosis. In the third group, who were not exposed to known tuberculous infection, no deaths from tuberculosis occurred among fourteen vaccinated and thirty-eight control children, though no fewer than six of the vaccinated children died from other causes within the first two months of life. In nearly all instances the diagnosis of tuberculosis was rendered practically certain by roentgenological, bacteriological, or post-mortem examination. Evidence was obtained that the oral administration of B.C.G. usually rendered the child susceptible to tuberculin. In the second and third groups, for example, the proportion of infants giving a positive reaction at some time within the period of observation to 0.01 or 1.0 mg. of tuberculin injected intradermally was 92.8 and 75 per cent. respectively in the vaccinated, and 36.4 and 23.7 per cent. in the unvaccinated children. Further, *x*-ray examination showed that in the first group 16.6 per cent. of thirty-six vaccinated and 56.6 per cent. of eighty-three control children had lesions in the lungs. In the second group the corresponding figures were 0 per cent. of thirteen vaccinated and 5 per cent. of forty control children, while in the third group none of the children in either group developed roentgenological evidence of pulmonary disease.

This investigation goes a considerable way towards providing the data that have been demanded by unprejudiced students of vaccination. It is regrettable that practically nothing is mentioned of the mode of selection of the infants for vaccination or of the degree of similarity of the subjects composing the vaccinated and control groups. The results, however, are very much superior to those recorded by Continental workers, in that they are based on comparison with a control group, and that the tuberculous nature of the lesions in fatal cases was definitely established. They support the thesis that B.C.G. vaccination may contribute in early life towards a diminution of the mortality in infants and children who are exposed to close contact with persons suffering from open tuberculosis.

## THYROXINE IN OTOSCLEROSIS

There would appear to be a strong prima facie case for the view put forward by the late Dr. Albert Gray[1] that otosclerosis is the result of a diminished blood supply to the organ of hearing, consequent upon a gradual failure of the vasomotor responses. The number of cases (fourteen) treated by him is small, but he was satisfied that in 50 per cent. of these definite improvement had resulted from the treatment administered. The assessment of hearing was made by the watch and whisper tests, and in each of the successful cases there is recorded an improvement by both. It will be noted that the improvement is one which in some cases shows an increase of a few inches only, while in others, by the whisper test, there is an increase of a foot or two. But the tests employed are only rough. It is almost impossible to standardize the intensity of the whisper, and the results of both tests will vary according to the amount of environmental noise. With much greater hearing capacity these factors are obvious, and with small amounts of hearing such as those recorded the difficulty in ensuring accuracy is at least as great. Even if these tests were recorded in a sound-proof room there would still be scope for variation in the accuracy of the testing. The value of the responses would have been much enhanced had the tests been carried out by some form of scientifically standardized sound, such as an audiometer test, or a test by calibrated tuning-forks. By means of an audiometer the amount of hearing loss is expressed in decibels, and a more accurate assessment of the patient's hearing before and after treatment can be made. This could then be translated into the equivalent of the ordinary conversational voice: thus a more familiar expression of the hearing distances, and accordingly of the improvement, could be rendered. An estimate of the conversational hearing can, however, still be arrived at from the result of the whisper test, but it must be borne in mind that there is not a constant relation between the whisper, or watch, and the conversational voice test. The patient's chief concern is how much conversation he can hear. The paper does not indicate whether Dr. Gray used the " forced " whisper or the " ordinary " whisper test, but assuming that the " forced " whisper was used, and in a sound-proof room, the following figures, which accord with careful assessments made by Harvey Fletcher, show the equivalents for the ordinary conversational voice of the results of Dr. Gray's whisper tests:

| Cases | Before Treatment | | After Treatment | |
|---|---|---|---|---|
| | Forced Whisper | Ordinary Voice | Forced Whisper | Ordinary Voice |
| | Inches | Feet | Inches | Feet |
| No. 1: Right ear ... | 24 | 12 | 60 | 28 |
| Left ear ... | 12 | 5½ | 24 | 12 |
| No. 2: Right ear ... | 8 | 3½ | 12 | 5½ |
| Left ear ... | 8½ | 4 | 36 | 17 |
| No. 3: Right ear ... | 15 | 7 | 36 | 17 |
| Left ear ... | 24 | 12 | 36 | 17 |
| No. 4: Right ear ... | 24 | 12 | 48 | 22 |
| Left ear ... | 18 | 9 | 42 | 19 |
| No. 5: Right ear ... | 12 | 5½ | 18 | 9 |
| Left ear ... | 8½ | 4 | 10 | 4½ |
| No. 6: Right ear ... | 6 | 3 | 9 | 4¼ |
| Left ear ... | 8½ | 4 | 9 | 4¼ |
| No. 7: Right ear ... | 18 | 9 | 36 | 17 |
| Left ear ... | 12 | 5½ | 24 | 12 |

From these figures it is apparent that improved values for the conversational voice are obtained after treatment in one or both ears in all cases with the exception of No. 6. The figures are based on the assumption that in these particular cases the relation between the whisper and the voice test is constant. If, then, these records, though made with rough tests, approach accuracy—and it is only right to assume that so careful and scientific a worker as Dr. Gray would have used all means to ensure the greatest accuracy possible—they are very suggestive of the correctness of the view put forward, and are an important contribution to the problem of otosclerosis. It will be noted, also, that in two of his cases tinnitus was relieved completely ; and in another,

[1] *Journ. Laryngol. and Otol.*, October, 1935, p. 729

almost completely. This in itself is an achievement, for in many cases tinnitus is intractable, and the hapless patient is driven almost to desperation. The medical profession, and otologists in particular, will await further reports on these cases, and will be anxious to learn how long the improvement lasts: whether further injections are required, and, if so, the subsequent history of the patients.

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## URTICARIA

Among the divers manifestations of the allergic state urticaria has engaged the attention of dermatologists for many years, and a good deal of light has been thrown upon it by various investigators. The views of the French school have been well set out by Professor Vallery-Radot and his colleagues in a recent monograph[1] on the subject. He points out that our views on the causation of this condition have changed much during recent times. Formerly regarded as a local dermatitis (*pur et simple*) it is now regarded rather as a disturbance of tissue fluids resulting in a cutaneous manifestation. The initial observation leading to this view was the classical research made by Vidal in 1911, who showed that the eruption was the last stage in a series of blood-vascular disturbances occurring in an individual sensitive to some foreign protein. American and German investigators, working on the cutaneous reaction produced by various antigens, came to the conclusion that urticaria was a phenomenon of anaphylaxis. This, however, is not enough, for it appears that many forms of urticaria could not be regarded as anaphylactic, but are the result of a sudden disturbance of tissue balance, such as may be caused by the action of cold. Urticaria is to be regarded, therefore, as a clinical cutaneous manifestation secondary to a blood-vascular disturbance. This disturbance may be set up by a protein or a crystalloid in a patient artificially made sensitive to it, or even in an individual who has not been sensitized but who is unfortunate enough to possess a *diathèse colloidoclasique*. It may even be produced by a physical factor alone, such as cold. In the monograph before us the urticarias are classified into four groups: (1) of anaphylactic origin in which the sensitiveness of the patient can be demonstrated by cutaneous tests ; (2) a very large group in which the *diathèse colloidoclasique* may be demonstrated ; (3) a badly defined series comprising those due to various disturbances of tissue fluids producing their results through the medium of the sympathetic system or the endocrine glands, or irregularities of alimentary chemical processes ; and (4) a mere exaggeration of normal vasomotor phenomena. Urticaria cannot be considered, by any means, as always due to a single pathological cause. The vasomotor disturbances which produce urticaria are evidence of stimulation of the sympathetic nervous system, but this stimulation may be the result of various disturbances which have been classified into the four groups above mentioned. Professor Vallery-Radot claims that this conception of urticaria is not only of theoretical interest, but leads to a rational therapy adapted to each patient. It is impossible to give details of the various forms of treatments outlined in this monograph. They comprise all the various methods by which it may be attempted to remove the cause of the eruption, if one is so fortunate as to be able to discover what that cause is ; the various injections that may be employed in order to influence the balance of tissue fluids, such as autohaemotherapy and autoserotherapy ; and, like a good Frenchman, he breaks a lance in favour of the baths and waters of Vichy. As a précis of modern views on the subject of this baffling disease the monograph is well worthy of attention.

[1] Les Urticaires, *Nutrition*. Tome v, No. 1. Paris, 1935.

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## INDUSTRIAL PSYCHOLOGY

The annual report of the National Institute of Industrial Psychology, which was published in the December number of its journal, the *Human Factor*, shows that good progress has been maintained during the past year.[1] In the advancement of vocational guidance schemes the rate of progress has been specially striking. Nearly 1,200 persons were examined at the Institute itself, while local schemes of guidance were run by the Education Committees at Birmingham and Hull in co-operation with the Institute. These schemes were approved by two Advisory Councils of the Ministry of Labour, and a recommendation was made that the Ministry should be prepared to make a grant to a limited number of other local authorities for similar experiments. Several courses of instruction for teachers in the technique of vocational guidance have been given, and the technique itself has been advanced in various directions through researches undertaken by investigators attached to the Institute. Unfortunately it may be necessary to curtail the research work of the Institute drastically in the near future, for the special grant hitherto received from the Rockefeller Foundation is shortly coming to an end. The Institute begs its friends to do what they can to help by increasing their donations and subscriptions, and by bequeathing legacies. What an excellent opportunity for valuable service the Institute affords to some wealthy benefactor! The work done by the Institute which is probably of the most direct interest to the medical profession relates to its tests for motor drivers. These tests are used for examining individuals who wish to know what level of driving ability they are likely to attain and where their weak points lie. Similar tests, used by the Paris tramway and omnibus services, were found to be associated with a reduction of 37 per cent. in the accidents incurred during the last few years, although the number of vehicles had meanwhile increased 30 per cent. Replicas of the Institute's tests are being used in the selection of drivers on the Bombay tramways and the Norwegian railways, and—in this country—the dummy car used in the tests has been adopted by a motor driving school as a training device. Numerous other researches by investigators attached to the Institute were made in factories, offices, and shops, covering a wide variety of occupations, while valuable educational work in connexion with the University of London is being achieved by the numerous courses of lectures and practical instruction organized by the Institute.

[1] Institute of Industrial Psychology, Aldwych House, London, W.C.2. (2s. 6d.)

## VACCINOTHERAPY FOR ASTHMA

Dr. Frederico Nitti, in his monograph on vaccinotherapy in bronchial asthma,[1] gives a short review of the subject and describes in full some interesting experiments of his own. His opening statement summarizes both his and other recent authors' work—"Asthma is not truly a microbial disease, but in relatively numerous cases vaccinotherapy brings about a very notable improvement." The work is divided into four categories. In the first Nitti deals with the bacteriology of the sputum in thirty-five cases of asthma The predominant organisms found were streptococci (haemolytic and *viridans*) and Gram-negative cocci (*M. catarrhalis, flavus,* and *crassus*). The bacteriological findings in cases of bronchitis without spasm were indistinguishable from those of asthmatics, nor did the findings vary in cases of asthma before and after treatment with autogenous vaccines. In the second part Nitti discusses whether a sensitization to bacteria does occur in asthmatics. He carried out intradermal tests with emulsions of the germs isolated from the sputum in twenty-two asthmatics. Though some positive reactions were obtained (especially to the Gram-negative cocci) these reactions could not be classed as specific because—(*a*) larger positive reactions could generally be obtained with bacteria not belonging to the air-passages (such as the gonococcus and T.A.B. vaccine prepared in identical fashion), and (*b*) cases of bronchitis without asthma and many healthy subjects gave reactions analogous to the asthmatics. He concludes that bacterial sensitization cannot play an important part in the pathogenesis of asthma. In the third part he considers the clinical application of vaccinotherapy in cases of asthma, and infers that it should only be employed in cases with much muco-purulent expectoration and moist signs on auscultation. In these cases it may render the patients more resistant to common germs infecting the air-passages and lessen the intensity of any localizing 'trigger" in the bronchi. In the fourth part he deals with the therapeutic results. Of twenty-one cases treated by prolonged intradermal injections of autogenous vaccines and one case by a polyvalent stock vaccine there was improvement in fifteen cases, but only one remained entirely free for one year. The twenty-year-old empirical idea that vaccinotherapy has a specific anti-anaphylactic action or that bacterial sensitization plays an important aetiological part in cases of asthma is fast losing ground, as modern researches, including these of Nitti, tend to prove that any such association is merely a non-specific one.

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## A MEDICAL EMBASSY

In republishing from the *Fife Herald,* for circulation among friends, his travel notes upon the recent B.M.A. tour to Melbourne and back, Dr. C. E. Douglas confesses that he found difficulty in deciding on an appropriate title. For a sufficient reason he rejected the term "Odyssey," though it would have had the advantage that his readers could properly have hailed him as Nestor. After dismissing certain other alternatives, he plumps for "Medical Embassy" as the best phrase for the occasion. Rightly, we think, he avoids the formal catalogue of office-bearers in the various Oversea Branches by whom the B.M.A. party was officially welcomed and entertained at every place of call: these must be chronicled in any exhaustive account of the tour, but would overload so personal and intimate a travel-diary as this. But like the fervent Scot he is, Dr. Douglas cannot resist the opportunity of telling the world about the Scotsmen—and Fifeshire Scots in particular—with whom he forgathered in all sorts of out-of-the-way corners of the Empire: not all of them, curiously, were "heads of departments." Dr. Douglas does not attempt to describe in detail all the wonders and marvels which were revealed to the tourists; he prefers a selective commentary, dallying most over those things and places that interested him, and skipping lightly over the (to him) less attractive. He avoids personalities, though some of his fellow travellers will feel sorry that he could not find it in his heart to recount a few of the not unkindly jests which used to appear in the daily news sheet on board the *Aorangi.* Naturally, he is too modest to tell us who won a certain chess championship; and of the delight of all on board when the strenuous final match—said to have taken up two whole days—at last ended in the defeat of his distinguished opponent. If he had been a sporting journalist he could have composed a thrilling account of the final of the ladies' singles at deck tennis on the *Aorangi,* as good an exhibition and as prolonged a struggle as any of those who saw it are ever likely to see again. We must not cavil at what Dr. Douglas has omitted; for he could not get in everything within the compass of this pamphlet, and he does tell of his flight across France from Marseilles, and of the (drawn) chess match he played with the Chairman of the Representative Body in the aeroplane! But is he sure that Toronto is on the shore of Lake Huron? One last word of appreciation is due to Dr. W. S. Paterson for the photographs he has lent the author of this booklet to illustrate his "Medical Embassy."

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## THE HALF-YEARLY INDEXES

The usual half-yearly indexes to the *Journal* and to the *Supplement* and *Epitome* have been printed; they will, however, not be issued with all copies of the *Journal,* but only to those readers who ask for them. Any member or subscriber who wishes to have one or all of the indexes can obtain what he wants, post free, by sending a postcard notifying his desire to the Financial Secretary and Business Manager, British Medical Association House, Tavistock Square, W.C.1. Those wishing to receive the indexes regularly as published should intimate this.

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We regret to announce the death in London on January 20th of Captain S. R. Douglas, F.R.S., deputy director of the National Institute for Medical Research, Hampstead, and director of the Department of Experimental Pathology.

[1] *La Vaccinothérapie dans l'Asthme Bronchique. Les Indications.* By Frederico Nitti. Paris: J. Peyronnet et Cie.

# TREATMENT IN GENERAL PRACTICE

*This article is one of a series on the management of some diseases of the digestive system met with in general practice.*

## THE SURGICAL TREATMENT OF PEPTIC ULCERS

BY

Sir JAMES WALTON, K.C.V.O., M.S., F.R.C.S.

The fascination, and indeed the difficulty, of medicine lies in the fact that even when a diagnosis is established with certainty there is no clear line of treatment. Whether we realize it or not, with every patient we have to balance most carefully the risks of one method against those of another. In a young, healthy patient an operation may be a procedure of very little risk, and may save him from very grave disability and many dangers in after life. On the other hand, surgical intervention for a precisely similar lesion in a weak, elderly patient may be a most hazardous procedure to life, and greatly outweigh the risk of the underlying disease.

In patients with peptic ulceration there may be a great diversity of risks, so that it is impossible to make dogmatic statements as to the line of treatment to be carried out in an individual case ; moreover, many different opinions have been expressed as to the routine methods to be adopted. Fortunately to-day, as our knowledge increases, the views of physicians and surgeons are more closely approximated, and certain general principles are being accepted.

### Selection of Cases

In the case of an uncomplicated gastric ulcer the first essential lies in an exact diagnosis of the nature of the lesion. Although in well-defined cases there is a sharp distinction between the symptoms and physical signs of an acute and chronic lesion, there are borderline cases in which this distinction is not so clear, so that every care has to be taken in obtaining the history and in investigating the condition of the stomach. When acute erosions or small subacute ulcers are present no operation should ever be considered. Patients are not infrequently sent to the surgeon with the statement that pain or vomiting has persisted in spite of medical treatment, and an operation is requested. In such instances the medical treatment has generally been incomplete, and the symptoms will always yield to a sufficiently rigorous regime. But even if this were not so, it is almost certain that no surgical measures would give relief in the absence of a demonstrable lesion.

With single chronic ulcers agreement as to the value of medical treatment is not unanimous, but probably every surgeon would agree that no operation should be undertaken until an adequate course of medical treatment has been tried. Many surgeons may believe that a long-established deep ulcer will not yield to such therapy, or that, if relieved, the condition will recur when the patient returns to his normal life. Provided, however, that no complication is present no harm can arise during the course of such treatment. The younger the patient and the shorter the history the more likely are medical measures to be successful. It is essential, however, that the diagnosis be accurate. The chief, and in fact the only real, danger of medical treatment is that a patient with a short history of loss of appetite, loss of energy, and discomfort, is diagnosed as a case of chronic ulcer after *x*-ray examination when he is in reality suffering from carcinoma, and the only opportunity of a cure by surgery is allowed to pass. The same considerations are true in the case of a chronic duodenal ulcer, but here the danger of the presence of carcinoma is almost non-existent.

If an adequate course of medical treatment fails to give relief, if the symptoms return as soon as the patient undertakes his normal life, or if the restrictions placed upon his work and diet after the immediate cure are too onerous for his position in life, surgical intervention must be thought of. This latter consideration is of great importance with many of our hospital patients. Many men upon whom I have operated are stevedores and dock labourers. They cannot take milk or eggs to their work ; their midday meal consists of a piece of meat, bread and cheese, and probably beer. If they cannot take such food they are unable to continue with their work.

### Type of Operation

The nature of the operation differs in the hands of various surgeons. Some believe that all peptic ulcers must be treated by excision of the greater part of the acid-secreting portion of the stomach. My own view is that the routine use of so extensive an operation carries too high a mortality, gives a relatively large risk of subsequent anaemia, and does not entirely free the patient from the danger of recurrent ulceration. For these reasons I prefer to treat duodenal ulcers by a posterior gastro-enterostomy, which has a risk to life of less than 1 per cent., and to reserve partial gastrectomy for the patients—in my own experience between 3 and 4 per cent.—who later develop gastro-jejunal ulceration. For gastric ulceration, gastro-enterostomy is rarely sufficient, and should be employed only for patients who are gravely ill, where it may be a temporary or palliative measure. In the greater number I have obtained the best results by a resection of the ulcer combined with gastro-enterostomy, but I perform partial gastrectomy for large ulcers and for those with the slightest evidence of carcinoma.

Peptic ulcers may be associated with mechanical changes. A long-persistent duodenal ulcer may cause fibrosis and narrowing of the intestinal lumen, leading to the so-called pyloric stenosis. An ulcer on the lesser curve, if it occurs in a woman subject to visceroptosis, may give rise to a zone of fibrosis which, passing to the greater curve, contracts the stomach and causes an hour-glass narrowing ; this may also be associated with ulceration and fibrosis at the pylorus. These complications usually manifest themselves by the presence of vomiting. It is evident that no form of medical treatment can hope to overcome fibrosis and narrowing of this nature, and operative treatment must be advocated.

It is for the stenosing ulcers of the duodenum that gastro-enterostomy yields the most satisfactory results with a very low mortality ; hence it should be the operation of choice. Some surgeons prefer a plastic operation such as gastro-duodenostomy, but it is a measure which has not gained much favour in this country and seems to have no advantage over posterior gastro-enterostomy.

When an hour-glass stomach still has a relatively wide isthmus I prefer to perform a wide wedge resection with a gastro-enterostomy running along the greater curve, as this has a low risk and does not remove a large portion of the normal stomach. If the isthmus be very narrow

a partial gastrectomy must be done, an operation which many surgeons perform as a routine measure for this lesion. All the older plastic operations are unsatisfactory, in that they leave the active ulcer untouched.

Although there is still a good deal of discussion as to the frequency of carcinomatous changes in a chronic ulcer there is no doubt that this complication may arise. Hence if the symptoms have altered in character—the last attack being longer, the pain less severe but more persistent throughout the day, the vomiting more frequent but giving less relief, and the appetite poor—the onset of carcinomatous changes should be diagnosed and an operation performed at the earliest opportunity. In such cases a partial gastrectomy should always be carried out.

### Perforated Ulcer

A perforation of a gastric or duodenal ulcer may take place in a patient who has already been under treatment for symptoms recognized as being due to a chronic ulcer, or it may be the first symptom for which the patient has sought advice. My own experience has been that such perforations nearly if not always occur with chronic ulcers, and that a past history of the symptoms of such a lesion can usually be obtained. The sudden onset of severe and constant pain and the characteristic rigidity of the abdomen will almost always lead to a definite diagnosis even in the absence of shock and in the presence of a normal or slowed pulse rate. When a perforation is present an immediate operation is demanded, and the credit of the enormously improved results in recent years belongs more to the practitioners who have made an early diagnosis than to the surgeons who have carried out the operations.

The essential step consists in suture of the perforation. If the peritoneal cavity contains much stomach content it should be drained. My own opinion is that ulcers that perforate are chronic in nature, and that a suture alone will rarely lead to a complete cure. Thus if the patient's condition is good a gastro-enterostomy should be performed at the time, but if he is gravely ill, or if the surgeon feels that he cannot perform the anastomosis rapidly, he should be content with suture, but should carefully watch the patient after recovery for symptoms of persistent ulceration.

### Operation for Haematemesis

One of the most difficult complications of peptic ulcer that the practitioner has to treat is the presence of severe haematemesis. Theoretically it should be prevented by adequate treatment of the ulcer, but many patients, although subject to chronic indigestion, do not seek advice until the onset of the haematemesis. Each case must be considered a problem in itself, and no definite rule can be laid down. The haematemesis is often so severe that the patient's life is in grave danger ; he may indeed die within an hour or less, so that any operative intervention becomes a matter of extreme risk. On the other hand, if the perforated artery be left it may continue to bleed or may bleed again at a later date.

The bleeding may arise from a small artery that is perforated in the base of a minute erosion which it is impossible to find at operation. Hence the majority of physicians and surgeons are of the opinion that no operation should ever be carried out for the bleeding in acute ulceration. I feel, however, that there are a few exceptional cases in which the bleeding has recurred in spite of strict medical treatment, and in which the patient's life might be saved by operation. In such instances no attempt must be made to seek for the bleeding point, but the pylorus should be temporarily occluded and a gastro-enterostomy performed. If the surgeon does not feel that such indirect measures will control the haemorrhage he should not operate.

In a chronic ulcer the haemorrhage is usually controllable unless a large vessel such as the splenic or coronary be eroded, in which case the patient generally dies before treatment can be instituted. As a rule, therefore, he should be put to bed, be given morphine, and no food must be taken by mouth. A very useful measure, however, is to give one drachm of adrenaline in one drachm of water hourly by mouth ; this will often control the haemorrhage until the vessel is sealed. When it has ceased the patient will only be allowed fluid, and ultimately food, by mouth, in very slow stages.

In exceptional cases operation may be required at once, but generally it should be reserved for patients whose haemorrhage is not controlled by medical means. If performed it should only be carried out after a blood transfusion, and in most cases it will have to consist of some local measure to the ulcer. If the haemorrhage is from the duodenum, the lumen may generally be entirely occluded, and thus the haemorrhage in any area controlled, by a well-placed mattress suture, the insertion of which is followed by a gastro-enterostomy. An ulcer on the lesser curve may be excised or the bleeding sometimes controlled by ligatures around the ulcer. In those cases which have been controlled by medical treatment an operation should be considered as soon as the patient's condition warrants surgical intervention.

## TRISTAN DA CUNHA

### A VISIT TO THE LONELY ISLAND

BY

E. F. D. OWEN, M.R.C.S., L.R.C.P.

SURGEON R.M.S. "EMPRESS OF AUSTRALIA," CANADIAN PACIFIC STEAMSHIPS

During the recent cruise of the *Empress of Australia* I had the good fortune to make my second visit to this very interesting island. The purpose of the visit of the vessel was to land stores and food. The island receives a visit from a ship about once a year, these calls being the only communication the islanders have with the outside world. The island was discovered in the year 1506 by the famous Portuguese sailor Tristan da Cunha. It was not inhabited, however, until 1816, when it was settled by seven men belonging to H.M.S. *Falmouth*. Two of the men took their wives along with them from St. Helena, and later five coloured women were sent from St. Helena, to become the wives of the other five men. At the present time seven surnames are to be found—Glass, Swain, Rogers, Hagen, Green, Lavarello, and Repetto. The total population is 169, of which ninety-three are males and seventy-six females. In addition there is one parson, who serves a term of residence of three to four years.

All the cottages I visited were exceptionally clean and tidy. Gramophones were in several, and dance music appeared to be the favourite form of music. The parson, apart from his pastoral duties, acts as doctor, dentist, schoolmaster, scoutmaster, and general adviser to the community. Money is unknown in this lonely island, all trading being done by barter. The people are governed by a Parliament, which meets every Saturday night. This consists of the "Chief," who is appointed by the populace, the parson, and the eldest male in each family.

### The Inhabitants

The women appeared to be far more intellectual than the men. They were quicker in movement and thought, and took a greater interest in what was going on: the men were lethargic, and without the driving force of the parson would be lazy. The women appeared clean in spite of the fact that soap is an article of rarity. They are fond of loud colours, and their style of dress is that of 100 years ago. The men did not appear so clean and tidy. All the men and women are slim and of average height ; not one stout person was seen. The children were

strong and healthy-looking, and were polite and not at all bashful at meeting strangers. They compared favourably with any bunch of children to be found in rural England.

The main diet consists of potatoes, milk, and fish—very little meat being eaten. During the nesting season penguin and albatross eggs are to be had in great numbers. Vegetables are plentiful, especially cabbage, turnips, and pumpkins. All are very fond of sweet foods and sugar. No alcohol in any form is taken. Apart from food grown or caught, the islanders have to rely solely on what they can get from the infrequent ship.

No lavatory system exists, the open ground being used. No sign of any human excreta was noticed on the ground about the settlement, but an abundance of animal matter was to be seen everywhere. This fact no doubt accounted for the large number of flies.

### The Public Health

The general health of the community is excellent. Very seldom does a young person become ill, and then usually only with a minor complaint. The people live a long life, the last two persons to die being 86 and 95 years respectively. An interesting point is that "colds"

Tristan da Cunha: The Beach and Natives.

are rare, but an epidemic often occurs after the visit of a ship. No infectious diseases have occurred on the island, and no condition resembling tuberculosis or venereal disease is known. The following cases of illness were present at the time of my visit:

1. A male aged 64 years, who had had recent haematemeses and marked loss of weight. From the history and clinical examination the case was probably one of carcinoma of the stomach. This man also showed advanced pyorrhoea and had an inguinal hernia. He was wearing a truss, which he had obtained from a ship some years ago.
2. A male aged 45 years, with a cataract in the right eye. The eye is quite blind, and sight is now failing in the left eye.
3. A male aged 12 years, suffering from catarrhal conjunctivitis of both eyes. Conjunctivitis is fairly common, and is probably due to exposure and weather conditions.
4. A male aged 65 years, with a varicose ulcer of the left leg. He has had this condition for some years. Five years ago he was given passage in a Danish tramp to Capetown, where he entered the Somerset Hospital, but returned to the island before the ulcer had healed. Whilst in hospital his teeth were extracted owing to presence of pyorrhoea, and he was fitted with a set of artificial dentures. He possesses the only set of dentures on the island, and is very proud of the fact.

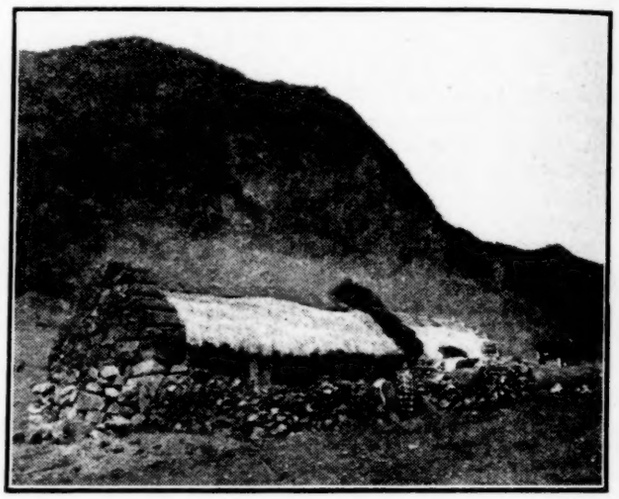
A number of the men had ruptures, but strangulation never appears to have occurred, in spite of the fact that they do heavy work such as rowing and lifting weights. A few possessed old trusses. Several men complained of muscular pains, but in no case could evidence of arthritis be found. Some of the older people are complaining of short sight, which prevents them from reading. Only three pairs of eyeglasses are on the island, and these appear to be common property.

### Congenital Abnormalities and Insanity

Only one case of congenital abnormality was found—a male aged 64 years, who showed congenital absence of the forearms, with malformation of the humeri. At the ends of the stump-like arms were digits, three on the right side and two on the left. The mental condition of this man appeared normal, but he has not been allowed to marry. Only one case of complete insanity has been known. This was a woman who died some years ago. Her children, now grown up, appeared normal. One imbecile was found—a male aged 23 years, a cretin. This man is dumb, but can hear, he, too, will not be allowed to marry. So far as could be seen continual intermarrying has not brought about any mental or physical degeneracy. Any mental dullness, whether apparent or real, can be easily accounted for by their complete isolation from the rest of the world.

### Island Midwifery: Individual Health

The midwifery is done by one woman, assisted by her two daughters. This woman was taught by her mother, and her daughters will take over when their turn comes.



Tristan da Cunha: Typical house.

No antiseptics are used, and no ante-natal examinations are made. It is the boast of the island that no mother has ever died in childbirth. Children have been born dead or have died soon after birth: almost all births are vertex presentations and, naturally, all children are breast-fed.

The condition of the teeth in the young men and women was excellent. The teeth have a regular formation, are very clean, and showed no signs of decay. Above the age of 40 several mouths showed pyorrhoea, some in an advanced stage. The teeth are cleaned daily with a piece of wet rag dipped in salt. Apart from one child, no case of hypertrophied tonsils was found, and this child appeared otherwise healthy. Constipation is rare, and laxatives have seldom to be taken. No hospital or sick-room exists. The parson keeps a cupboard in his cottage in which were found bottles of quinine tablets, aspirin, iodine, lysol, a few packets of bandages, lint, cotton-wool, and gauze. Surgical equipment consisted of one pair of scissors and one pair of dressing forceps. There was also an abundant supply of Epsom salts and castor oil.

Without doubt if these islanders were to be transported to a populated area they would succumb to every disease that came their way. As an instance, one young man of 28 left the island five years ago and settled in Capetown: within two months he contracted measles, within six months scarlet fever, and for the first two years suffered from repeated colds.

On being asked if they would like to leave the island most of the young people said they would, but the reply of the older folk was "No; this is home."

# PUBLIC HEALTH LAW

## CONSOLIDATING MEASURE TO BE PRESENTED

For the last three years a Departmental Committee has been attempting to reduce to order a difficult and complicated branch of statute law—namely, the enactments relating to public health. Such legislation goes back for sixty years, to the great public health charter of 1875, or, indeed, in more local and disparate forms, to the beginning of the Victorian reign. The Act of 1875 was itself a consolidation of a large number of different and overlapping Acts, from the Public Health Act, 1848, onwards, and even that parent Act was largely based on clauses stereotyped in local Acts of the early nineteenth century, with, of course, little or no uniformity in drafting. Between 1875 and 1932 there were sixteen Public Health Acts so-called, but also a large number of other important measures, such as those concerned with the notification and prevention of infectious diseases, or with maternity and child welfare, which in every respect except title come into the same category.

The result of the Departmental Committee's labours appeared on January 16th, under the formal title of the Second Interim Report of the Local Government and Public Health Consolidation Committee,[1] together with the draft of a Public Health Bill prepared by the committee to be presented to Parliament by the Minister of Health during the present session.[2] The committee, which carried out its later work under the chairmanship of Lord Addington (the original chairman was the late Lord Chelmsford), was appointed in 1930 by Mr. Arthur Greenwood, then Minister of Health, with a double reference. Its first duty was to consider the enactments applying to England and Wales (exclusive of London) which have to do with local authorities and local government, with a view to grouping them in consolidating legislation. It discharged that part of its reference in 1933, with results which were embodied in the Local Government Act of that year. Since then it has devoted itself to the second part of its reference—namely, to deal in the same way with the various enactments relating to public health.

### The Scope of the Bill

How large an undertaking this has been may be judged from the fact that it has occupied fifty-nine meetings. The report runs to 134 pages, and the draft Bill is a gigantic measure of 334 clauses (almost the same number as the Act of 1875) and two schedules. Even so, the Bill represents a great simplification, because it replaces more than 550 sections in fifty-five separate Acts. On one minor subject alone—for example, that of baths and washhouses—it substitutes a code of thirteen clauses included in one Bill for sixty-four sections in eight Acts. The Bill consists of twelve parts, and ranges over building sanitation, nuisances and offensive trades, common lodging houses, water supply and sewage disposal, infectious diseases, local authority hospitals, and maternity and child welfare. The number of former Acts which it is proposed to repeal in whole or in part is sixty-one, but of course the provisions are for the most part re-enacted in a slightly different form, free from anomalies and anachronisms, and in better relation to the whole body of statutes. The committee makes no claim that the "Public Health Act, 1936," as it may be known, is an ideal public health law, only that it will be a more or less logical and correlated one. The task of the committee has been to codify rather than to legislate, and apart from a few respects, to which reference will be made later, the Bill will not make any considerable departures in public health administration, but will make for smoother working and enable the letter of the law to be a better expression of the spirit. It is to apply to England and Wales exclusive of London; London is only concerned in a few express provisions.

A Bill of 334 clauses might be supposed to be comprehensive enough to cover all aspects of public health which require statutory provision. But, in fact, had the committee interpreted its reference rigidly it might have produced an elephantine measure of 1,000 clauses. The various Public Health Acts contain a large number of provisions not strictly of a public health nature—for example, provisions with regard to streets and building lines, food, recreation grounds, river pollution, burial, and cremation. The committee has taken the view that it would be advantageous to have several Bills each of moderate length dealing with these various matters, and the present Bill confines itself to:

> "Provisions of a strictly public health character relating to the prevention and treatment of disease—that is, as regards environment, to such matters as drains and sewers, buildings, water supply, and the abatement of nuisances, and as regards personal hygiene, to such matters as the provision of hospitals, maternity centres, etc."

The term "public health" in its widest sense might also be held to include the Acts relating to housing and to lunacy and mental deficiency, but the committee has drawn a line here, taking the view that such Acts have always formed separate groups of their own and should remain distinct codes. The same with the Midwives Acts from 1902 to 1926; these form a code for midwives, being comparable with the Medical Acts and the Dentists Act, 1921, and the committee has decided to leave that code alone.

### The Principle of "Adoption"

One difficulty which awaited the committee lay in the fact that many of the provisions of the Public Health Acts operate only after they have been "adopted" by the local authority or have been put into force by order of the Minister. Admittedly these procedures in the past have proved convenient as legislative methods, but the committee feels that the principle of "adoption" has been overworked, and that, with certain exceptions, the "adoptive" proposals of many of the old Acts might properly be made of general application. This will not only mean a great simplification, but will in itself be a considerable piece of social legislation. Often a double battle has had to be fought, the first stage in Parliament, and then, a measure having been passed in an adoptive form, a series of engagements on local fronts, to get authorities to assume the new functions or powers which are open to them. The few exceptions which it is proposed to leave relate to cases where the Minister may invest individual rural authorities with powers that are more generally applicable to urban areas.

Government by regulation has been often assailed. The committee, following upon the opinion of a recent Joint Select Committee that the requirement to lay regulations before Parliament should only be imposed in the case of those of substantial importance and of a legislative character, has embodied very few regulation-making powers in the present Bill. In the first schedule it is laid down that the Minister may by regulations prescribe the qualifications to be held and the duties to be performed by medical officers of health of port health districts, also their mode of appointment and terms as to salary and tenure of office. This is new law, but it follows on the action taken by Parliament in 1933 in regard to medical officers of health of boroughs and urban and rural districts.

A more important clause which is under regulation procedure is the one dealing with the prevention and treatment of infectious disease. This provides that the Minister may make regulations with a view to the treatment of persons affected with any epidemic, endemic, or infectious disease, and for preventing the spread of such diseases; also for preventing danger to public health or the spread of infection by vessels or aircraft arriving or leaving. This provision, which extends to London, repeats the substance of Section 130 of the Act of 1875, omitting the special reference to cholera, and bringing in aircraft as well as ships.

### Definition of Notifiable Diseases

On the general subject of notification of disease, the committee notes the number of expressions used at different times to denote infectious disease. The Act of 1875 uses five different terms, all without definition. In the Infectious Disease (Notification) Act, 1889, a list of infectious diseases is given, which list is reproduced in subsequent legislation, but there is added some such phrase as "and any other infectious disease." Such

[1] H.M. Stationery Office. Cmd. 5059. (2s. net.)
[2] Cmd. 5060. (3s. 6d. net.)

variety of expression cannot be permitted in an Act designed to simplify and clarify the law. In the new Bill two expressions only are used: "infectious disease," which is left undefined, and "notifiable disease," which in the interpretation clause is given as meaning

"any of the following diseases—namely, small-pox, cholera, diphtheria, membranous croup, erysipelas, the disease known as scarlatina or scarlet fever, and the fevers known by any of the following names, typhus, typhoid, enteric, or relapsing, and includes, as respects any particular district, any infectious disease to which Part V of this Act [Prevention, Notification, and Treatment of Disease] has been applied by the local authority of the district in manner provided by that Part."

This reproduces the list of 1875, except for "continued fever" and "puerperal fever." The term "continued fever" is an old one, which included undiagnosed cases of typhoid, paratyphoid, typhus, and other long-continued pyrexias, and is thought to have little or no significance to-day. It is also proposed for the sake of administrative simplicity as well as on medical grounds to omit from the statutory list "puerperal fever" (which falls within the wider class of cases known as puerperal pyrexia), so that all cases of puerperal pyrexia can be brought within the fuller requirements of the regulations. Diseases such as tuberculosis, for the notification of which provision may be made by regulations, will remain on the same footing as before.

The provisions with regard to the disposal of the dead are slightly amended. Under the old law if a justice of the peace was satisfied on the application of a medical officer of health that the retention of the body of a person who had died from infectious disease would endanger the health of the inmates of the building or neighbouring buildings he could order removal to the mortuary. This has been re-enacted, but "certificate" has been substituted for "application" as being a more convenient procedure, and the reference to infectious disease has been omitted on the ground that whether the death has occurred from infectious disease or not, the real ground for ordering removal of the body is that of danger to the health of other persons. It is also recommended that the law regarding mortuaries be slightly altered. Not only a local authority but a parish council may, under this measure, and if required by the Minister must, provide a mortuary and a post-mortem room. The 1875 Act suggested that the post-mortem room might be otherwise than at the mortuary, but the committee feels—and alters the wording to admit of it—that the best place for such a room is at the mortuary if it is properly separated from the rest of the building.

### Local Authority Hospitals

In attempting to consolidate the law with regard to hospitals, the principal difficulty has arisen over the isolation hospital, which entails a cumbrous committee procedure. The Isolation Hospital Acts of 1893 and 1901 contain details which now it would be unnecessary to reproduce—for example, that "every hospital shall be connected to the telegraph system." The position of county councils in respect to hospital provision has been altered by the Act of 1929, and the machinery of the older Acts is no longer necessary. It is recommended that after a short interval they be repealed, and the existing isolation hospital committees converted into joint hospital boards.

The procedure for recovery of maintenance expenses from patients at public hospitals is anomalous owing to the desire to distinguish between the liability of infectious and non-infectious patients. That distinction must be maintained, but it is thought desirable to combine the provisions in one clause and to confer on county councils a power (which other local authorities have had since 1875), but not a duty, to recover the cost of maintenance in a case of infectious disease.

No statutory provision has existed enabling local authorities to provide a laboratory for general purposes. This is to be regularized by a clause permitting local authorities (including county councils) to provide a laboratory for the diagnosis and treatment of diseases and for making bacteriological and other examinations, and to allow any person to make use of the laboratory on such terms as the authority thinks fit. Other ambiguous phrasings are rectified. For instance, the 1875 Act mentioned the duty of authorities to provide accommodation for "inhabitants of their district" who are sick. The phrase is to be replaced by "persons," bringing the law into line with practice, for in seaside resorts and other places with temporary non-resident populations no distinction is made in this matter between resident and non-resident. Again, the old wording "temporary places for the reception of the sick," is to be replaced by "clinics, dispensaries, and out-patient departments," thus placing beyond cavil the right of the authority to provide for out-patients.

It is stated that in practically all areas the three services—notification of births, maternity and child welfare, and child protection—are in the same hands. The new Bill is accordingly drafted so as to define the local authority for all three. It assures that in any area only the one authority shall be responsible. Since the introduction of block grants the Ministry has relaxed its minute control over maternity and child welfare arrangements, and a slight redrafting is proposed to meet the new position, so that the authority may make such arrangements as it thinks fit, subject to the "general approval" of the Minister.

### Committees of Local Authorities

Some revision of the constitution of local authority committees is contemplated. Under the existing law every county council is required to appoint a public health and housing committee; a county or county borough council has the option of appointing a tuberculosis committee; and a county borough or district council must appoint a maternity and child welfare committee, but an existing committee may be given this function. The object was to give the authorities power to appoint certain persons as members of such committees who were not members of the local authority, but now every type of authority has general powers in this respect, and the committee feels that councils can be trusted to obtain the appropriate committee assistance. It is recommended that the compulsory requirement on county councils to appoint a public health and housing committee should be repealed, because some different grouping of functions might be more satisfactory. It is suggested that the section under which tuberculosis committees are set up should be repealed, being obsolete in certain respects, but in effect it is considered that repeal will make no difference. The committee has, however, reproduced the machinery for setting up maternity and child welfare committees.

In the large portion of the Bill which concerns sanitation and buildings two substantial amendments of the existing law are proposed. One of these relates to the "vesting of sewers in local authorities." The law on this point is obscure, and has been described by Lord Justice Scrutton as a "disgrace to English legislation." If the recommendations of the committee are carried into effect sewers which are constructed by private owners will not in future automatically vest in local authorities, but there will be a system of "taking over," powers being reserved to the Minister to decide in the last resort whether the local authority shall be required to take over a particular sewer on the application of the owner. The other matter involves a somewhat drastic alteration of the law with regard to buildings. It is proposed that the Minister shall have power to require every local authority to adopt a minimum code of building by-laws, and, further, that the by-laws shall not operate for more than ten years, when it will be necessary for the authority to reconsider and remake them, with or without amendment.

Except in these last two instances the alterations proposed in the Bill are not drastic, but it is realized by the committee that while their earlier measure, brought forward three years ago, was concerned for the most part with the machinery of local government, the present Bill touches at many points the interests of individuals. Undoubtedly it extends the powers and duties of local authorities, but if it also provides more effective remedies than the existing law against arbitrary action on their part it will be to the advantage of the public.

# Reports of Societies

## RADIOLOGY IN OBSTETRICS

The Sections of Obstetrics and Gynaecology and of Radiology of the Royal Society of Medicine combined on January 17th for a special discussion on the use of *x* rays in obstetrics. Dr. W. FLETCHER SHAW, president of the former Section, was in the chair.

Professor D. DOUGAL of Manchester said that obstetric radiology had reached a stage of development at which it was desirable to take stock of the position. As an obstetrician he was fully conscious of the gaps in their knowledge and the imperfections in their methods of diagnosis and treatment. Radiology had already made substantial contributions to midwifery. They were all familiar with the anatomical features of the so-called typical female pelvis, but recently there had been a revival of interest in the variations which the pelvis might assume as a result of certain inherited influences, and these had been to some extent radiologically studied. The radiologist could also give the exact diameters of the pelvis and furnish information as to the nature and extent of the changes which occurred during pregnancy in the pelvic bones and joints. Again, he could give the size of the foetus, its disposition in the uterus, and the situation of the placenta. In labour, radiological studies had been made of the mechanism of the engagement of the foetal head and of the manner in which it passed the pelvic brim. As regards pathology it had been shown that a particular type of pelvis (android) predisposed to occipito-posterior positions. Abnormalities of the foetus, such as undue size and faulty attitude or malformation, were clearly shown. Appropriate radiological methods might reveal placenta praevia or ectopic pregnancy. All this, however, did not mean that the radiologist's services were always necessary or even desirable. Radiology was an ancillary service, and its proper function was to supplement, not supplant, the ordinary methods of clinical examination. Indiscriminate employment of ancillary services threw an unnecessary work on those services and had a harmful influence on the clinician's diagnostic abilities; but, he added, if this happened it was the fault of clinicians, because he knew of no experts who were less anxious to exceed their sphere than radiologists. At the same time the radiological examination was so valuable that a properly staffed and equipped *x*-ray department should be provided in every important maternity hospital, not only for diagnosis but also for research.

It was possible to demonstrate foetal parts radiologically from about the sixteenth week, but by that time it was usually easy to make a diagnosis of pregnancy by ordinary clinical methods. The Aschheim-Zondek test or one of its modifications had largely done away with the necessity for *x*-ray diagnosis in these cases, though a radiograph was still very useful when the patient denied the possibility of pregnancy. In the diagnosis of foetal malformations radiology had definitely established its superiority over clinical methods, and it was the practice of clinicians to send their cases of hydramnios to the radiologist, and the same applied to multiple pregnancy. The clinical method of estimating the expected date of delivery was sufficiently accurate for ordinary purposes, but now and again cases were met with in which it was inapplicable or misleading. He understood that radiologists could now estimate approximately the age of the foetus. The diagnosis of recent intrauterine death was almost impossible, and the safest plan was to wait until definite signs made their appearance, the most important being the overlapping of the cranial bones, which was best demonstrated radiologically; but caution was necessary in the interpretation, because intrauterine death had been wrongly diagnosed. For the purpose of determining the nature of ante-partum haemorrhage the radiologist had developed a technique in which a contrast medium was injected, but there were some objections to that procedure.

### The Problem of Disproportion

Thanks to the radiologist, Professor Dougal continued, accurate information could now be obtained on the diameters of the maternal pelvis and the foetal head. This achievement had roused very little enthusiasm among British obstetricians for the reason that most of them still believed implicitly in the dictum that the foetal head was the best pelvimeter, a statement which was accurate only if the foetal head happened to have the same attitude and to be lying in the same position as it would assume when labour began. In practice that method had led to a great deal of inaccurate diagnosis. Older obstetricians might have been a little too much concerned about the size of the female pelvis, but to-day too much attention was paid to the foetal head. The pelvis was a more important factor, because the pelvic canal was a rigid tube, whereas the relative size of the foetal head varied according to attitude, position, and plasticity. The radiologist had evolved a technique of radio-pelvimetry which made it possible to obtain an accurate picture of the pelvic brim. Every primigravida should have the pelvic brim examined radiologically, as only in that way was it possible to obtain accurate information about its size and shape without causing the patient discomfort. He did not attach so much importance to the position of the foetal head as determined by radiology, and he was not in favour of routine radio-cephalometry.

It would be said that the proposal that every primigravida should have a radiograph taken of her pelvic brim during the early months of pregnancy was a revolutionary one; that routine pelvimetry was unnecessary because the great majority of labours were normal. That argument was illogical, because at present every primigravida was subjected to clinical pelvimetry. It would also be said that radio-pelvimetry was expensive and should be reserved for cases in which some abnormality had been detected clinically. The answer was that some abnormalities, such as transverse contraction of the brim, could only be detected radiologically. Finally, it would be said that the pelvis was only one of several factors concerned in labour, and that it was better to wait until the later weeks of pregnancy, when disproportion had actually occurred and it was possible to obtain measurements both of the pelvis and of the foetal head. His answer was that the pelvis was the most important factor, and it was necessary to have this information early in pregnancy so that the probable course of labour might be foretold. He understood also that it was possible to obtain a much better radiograph of the pelvic brim in the early months before it was obscured by the foetal head.

### Relation between Clinician and Radiologist

Dr. R. E. ROBERTS agreed that before a case was submitted to radiological examination it should be considered fully from the clinical standpoint. In his own experience this was always done, and cases were referred for radiological examination only when the clinician found himself in doubt as to important features. He reviewed the problems concerning which the radiologist might be asked for assistance. One of these was as to the period of gestation. In most cases the clinician could form a fairly accurate estimate from the patient's history and from palpation of the abdomen, but occasionally the patient was vague as to her dates, or conception might have occurred during a period of amenorrhoea. The radiologist might base his estimate on the size of the foetus and the ossification of the bones. The only films which were used for comparative purposes in connexion with the size of the foetus were those taken in the prone position, using a constant film distance. They had to be content with an estimation of that part of the foetus whose distance could be fairly accurately measured—namely, the skull. The method advocated by Reece of measuring the short axis was a distinct advance on others. Taken as a whole, the cephalometric methods for estimating the period of gestation gave reliable results. Radiological pelvimetry could be carried out with relative ease in the early months of pregnancy, though it was difficult with the approach of full term. In his view the function of the

radiologist was to supply measurements of the pelvis with, when required, the mean diameters of the foetal skull. The application of these measurements was outside his province.

Probably in no branch of obstetric radiology was the information available from radiological examination so precise as in investigating the cause of hydramnios. Again, in good ante-natal radiographs, carefully interpreted, few if any skeletal abnormalities should escape diagnosis, though one of their limitations was in the diagnosis of mild hydrocephalus. The radiological diagnosis of extrauterine pregnancy was often extremely difficult, although there were cases in which the uterus was clearly outlined and the foetal parts were seen to extend beyond its limits. In placenta praevia direct radiography of the gravid uterus gave no reliable information on the position of the placenta, but two methods had recently been evolved in which contrast media were employed. The chief difficulty seemed to lie in correct interpretation: there appeared in many radiographs to be more than one site where a filling defect or a pseudo-defect might be located.

### Science to the Rescue of Obstetric Art

Dr. L. N. REECE considered that the cause of radiopelvimetry for all primigravidae had been won, but he wanted to challenge Professor Dougal's statement that cephalometry was relatively unimportant. It was the absence of accurate cephalometry in the past which had been responsible for the lack of interest shown by obstetricians in radiology. Without radiology no one could be sure of the maturity of the foetus and therefore of the diameter of the head or of its plasticity. Cephalometry would fix the last moment at which the head would pass through the birth canal. So-called trial labour undertaken without radiological examination was indefensible. It was the frank abandonment of the individual to the laws of chance. Induction of labour had fallen into some disrepute because of the methods adopted and the lack of knowledge of the essential factors concerned. Induction without radiology to-day was without excuse. It was not possible to know whether to do it, or when to do it, in any other way. He had been convinced of the complete safety and simplicity of the method of induction by rupture of membranes.

In cases of disproportion pelvimetry, together with cephalometry, made possible a clear distinction between the indications for induction and Caesarean section. In cases with a true conjugate of under 3.5 inches Caesarean section should be chosen ; at 3.5 inches or over induction should be performed at the latest moment compatible with the interests of mother and child. The combination of induction with ruptured membranes and the new radiological methods of examination opened up afresh the whole question of the management of disproportion. In straightforward cases the most valuable contribution of radiology was the verification of the date of confinement, making possible correct bookings of nurses and at maternity homes, and sparing anxiety in cases which would otherwise have been regarded as overdue. Given the certainty that there was no disproportion, there was every inducement to leave delivery to nature and to avoid mischievous and unnecessary interference.

He had the greatest respect for the principle that clinical methods should come first, but the best clinician could not compete with the radiologist at certain vital points. It was said that clinical diagnosis would deteriorate. But did the cardiologist dispense with $x$ rays because he feared that his fingers would lose the power of percussion? For how long would one use Braille for the benefit of one's fingers if one could use one's eyes? Radiology brought sight to the clinically blind—who were always in the majority! Even when all mechanical problems were solved midwifery would still retain sufficient of its secrets to demand full respect as a difficult art. Radiology in obstetrics had come to stay, and although in future many thousands of films would be wasted in the sense that delivery would have been safely accomplished without their help, yet many lives would be saved and much suffering prevented. The mothers of the future would have reason to be grateful that science had come to the rescue of this far too difficult art.

### Pelvic Measurements

Dr. H. C. H. BULL said that the need for pelvic measurements had been recognized for generations, but not until the advent of $x$-ray pelvimetry was accuracy possible. He dealt with certain criticisms of the method, but he considered that such measurement was the fundamental basis of scientific approach. In taking foetal measurements he used three positions—sitting, recumbent, and lateral—and measured whichever diameter of the foetal head was given by each of these positions, checking them off against one another. He found the tables given by Scammon and Calkins for diameters of the foetal skull to be of great service.

Dr. W. G. MACKAY spoke on the value of amniography, which investigation he had carried out on sixty-six occasions ; and he had satisfied himself that it was the most delicate test at the present moment of the position of the placenta. In all the cases in which it was employed it had been previously found impossible to decide where the placenta was situated by ordinary methods, but resort to $x$ rays made an accurate diagnosis possible in 90 per cent. The procedure had a disadvantage in its acknowledged tendency to induce labour, and should therefore only be used in the later stages when there was reasonable hope that the foetus would survive. Some of the uroselectan was swallowed by the foetus, but it was not absorbed, and remained in the lumen of the gut. If his observations were correct, it was only the foetal skin and gastro-intestinal lining which were subjected to the influence of the opaque substance, and in the cases in which he had carried out this investigation he had never observed any skin eruption or gastro-intestinal upset.

Dr. ARCHIBALD DURWARD discussed the subject as an anatomist. For some months there had been collaboration between the anatomical department at University College and the obstetric department at the hospital in an investigation into pelvimetry more especially, and cephalometry to some extent. As an anatomist he agreed with Professor Dougal as to the superior value of the indications given by the measurement of the pelvic brim. He also spoke of the various types of pelves. Dr. LESLIE WILLIAMS referred to the value of radiological examination in cases of transverse contraction of the pelvic brim, and gave an account of three examples of that condition. Dr. M. H. JUPE said that the discussion had turned largely on pelvimetry, but there was another important aspect in which $x$ rays played a part—namely, in the early diagnosis of pregnancy. It was true that the Aschheim-Zondek test had tended to make that unnecessary ; but still, he felt, the obstetricians asked for help in the differential diagnosis of early pregnancy. For this, radiological technique had still to be developed. At present he agreed that the foetus could only be shown radiologically with any degree of certainty at about the sixteenth week, but that was taking all types of patients, including the difficult and the very fat. If the radiograph were taken with the tube pointing out from below the pelvic brim he thought the foetus could often be shown at an earlier date, and that with modern apparatus and technique it would soon be possible to show it with a fair degree of certainty at the twelfth week.

Dr. L. A. ROWDEN took up the point about the expense of this radiological investigation. The expense should be no hindrance ; if these cases were done as a routine and batches of them were taken at a time the cost should not be large, and in any event the cost would be more than made up by the consequent diminution in the number of cases which, as things now stood, were sent into hospital as a last resource. With regard to pelvimetry, he had always emphasized that it was more important than cephalometry, and, moreover, it had only to be done once in a woman's lifetime. Cephalometry, if it was done at all, should be done a little before the eighth month, at a time when there was still a possibility of remedy if things were not right. Finally, Dr. BRYAN

WILLIAMS made the remark that in the annual reports of the defence societies the practitioner was warned that an *x*-ray photograph should be taken in every case of injury. He foresaw a time when the obstetrician would be similarly entreated, if he wished to forestall legal actions, to see that an *x*-ray investigation was made in every pregnancy.

The PRESIDENT (Dr. Fletcher Shaw), in closing the discussion, said that it was not the obstetrician only who had been slow in adopting radiological methods; the radiologist, too, had been slow in developing the technique, which was now so valuable. In Manchester use was now made of radiology in this field to a very large extent, but that was only because the radiologist had so greatly improved his technique.

## ALCOHOLISM AND CRIME IN RELATION TO MANIC-DEPRESSIVE DISORDER

At a meeting of the Society for the Study of Inebriety on January 14th, with Dr. WILLIAM BROWN, the president, in the chair, a discussion took place on the relation of alcoholism and crime to manic-depressive disorder.

### Symptomatology

Dr. W. NORWOOD EAST, H.M. Commissioner of Prisons, in an opening paper, said that manic-depressive disorder consisted of three phases: a state of mental depression, a state of mental exaltation, and a subsequent period of normal health. These phases might occur in variable order and might last for varying periods; the intervals of their occurrence might also be irregular. In both the depressed and the exalted phases three fundamental symptoms were to be noted: in the depressed phase, emotional depression, psychomotor retardation, and difficulty in thinking; in the exalted phase, emotional elation, psychomotor activity, and a rapid flow of ideas. In the depressed phase the patient experienced mental pain, and bodily movements and thought processes were slow, but consciousness was retained; the subject, however, was aware of his surroundings, and was often able to appreciate that he was mentally ill. In the exalted phase he had an exaggerated sense of well-being, was over-active, restless, unstable, inconsistent, and changeable, and might be unable to exercise self-control; his memory might be clear, his judgement unimpaired, and he might not realize that he was ill. This brief outline of symptoms required some amendment when the disorder was present in an aggravated form. The most profound degrees of melancholia, with stupor, delusions, and hallucinations, might then be present, and in the alternating phase intense excitement, violence, and incoherence. But in the milder cases the symptoms might be so slight as to escape notice by either the patient or his associates, and he might pass by imperceptible gradations into normality. For that matter, the temperamental level of many normal persons was not constant, and everyone had among his friends those who for no assignable reason had their good or bad days according to the measure of their emotional variations. From all this it was evident that the relation of alcoholism and crime to manic-depressive disorder might be clear and unequivocal when the abnormal mental state was well defined, but could be determined only by the skilled observer as normality was approached.

### Criminal Conduct Apart from Alcoholism

Manic-depressive disorder, Dr. East continued, gave rise to criminal conduct apart from alcoholism. Crimes of violence were more frequent in depressed than in exalted states. In a series of fifty-three depressed lawbreakers thirty-four had committed crimes of violence; and in a series of fifty-two exalted subjects, only seven. A manic-depressive subject might pass through the phases of the disorder without committing any offence, although some attacks were associated with crime, but personal experience had led him to believe that when the disorder was associated with alcohol the tendency to commit crime was materially increased. Further, the fact that crime was repeatedly associated in the same subject with manic-depressive disorder led him to consider how far alcohol was a contributory influence. When repeated crimes were due to the disorder, and alcohol was not an added factor, the intervals of normal health might be free from the moral degradation not infrequently observed when the condition was associated with alcohol.

When manic-depressive disorder was associated with alcohol and crime resulted, the evidence of recent excessive drinking might be so overwhelming that the underlying mental disorder escaped demonstration. In such cases the past history of the individual might assist the diagnosis, and if there was reason to believe that previous conduct was due to manic-depressive disorder it might be desirable for those conducting the defence to call medical evidence to support this view at the trial. The medical witness in such a case would not belittle his position or the value of his evidence if he submitted his opinion as a possibility and without unqualified assurance.

### Alcoholism and the Disorder

The concern of the society he was addressing was with alcoholism apart from criminal conduct, but of course it was impossible to draw any hard-and-fast line, as drunkenness, if followed by certain conduct, might itself constitute a crime. Periodic drinking associated with manic-depressive disorder was the true dipsomania of Legrain, who observed that an attack of dipsomania, though it might remain an isolated event in the life of the subject, was usually repeated, and took on a periodic character. Drinking in these cases was only an outward manifestation of underlying psychological, perhaps physiological, causes, independent of habit formation. A too limited view might be taken of dipsomania if the term was restricted to manic-depressive subjects, for some authorities considered that it might be related to epilepsy and might also be the expression of a compulsion neurosis. The consumption of alcohol in manic-depressive disorder was connected directly with the current emotional state; in the depressed phase the patient had learned by past experience its comforting effects, and in the exalted phase he was so joyous and expansive that he must share his happiness with others in extravagant festivity. "In the former state the alcohol is consumed in order to avoid reality; in the latter to enhance it."

Finally, Dr. East dealt with the detention of manic-depressive "alcoholics" and their treatment in prisons and licensed retreats. Between 6,000 and 8,000 people annually were received in prison for drunkenness; probably manic-depressive subjects were only a small proportion of these, but in total they might not be inconsiderable. People were sent to prison as a punishment, and although it might seem illogical to imprison anyone because his conduct was the result of constitutional disorder over which he had no control, it must be remembered that the prisons served also to protect the public, both actually during the detention of the law-breaker and potentially as a result of their deterrent effect. Moreover, imprisonment might be the only means of protecting the manic-depressive alcoholic from himself. A large number of such persons were not certifiable, or at least not certified, under the Lunacy Acts; others refused to accept the provisions of the Mental Treatment Act and enter mental hospitals as voluntary patients; and others refused to enter retreats. On reception in prison they came under medical care and supervision, and their return to normal mental health was expedited, partly as a result of medical treatment, and partly because the orderly life and the absence of temptation was conducive to recovery. It might be hoped that imprisonment would act sometimes as a deterrent if its imposition suggested to the subject that society disapproved of his conduct and considered that he should amend it. In any event patient and public must be protected from the effects of his disordered mind, and although it might seem harsh, yet in the present state of knowledge tem-

porary detention in a penal institution might be the only satisfactory method of dealing with some of these cases. Some manic-depressive alcoholics were suitable for dealing with under the Habitual Drunkards Act, 1879, if other alternatives were rejected and the reluctance of the patient to comply with the statutory provisions for admission to licensed retreats could not be overcome.

### Classification of Cases

Dr. HUBERT J. NORMAN, medical superintendent of Camberwell Home, who also read a short paper on the subject, said that it seemed surprising that a more accurate classification of cases of manic-depressive disorder had not been arrived at at an earlier date. The relation between attacks of mania and melancholia had in fact been noted as far back as the time of Thomas Willis in the seventeenth century, but it had remained for the great clinician Kraepelin (in 1896) to give a really adequate description. In acute cases the patients typified the classical examples, with "raving madness" and "melancholy madness," as figured by Cibber for the decoration of the old Bethlem Hospital. Even the layman would have no difficulty in deciding that such individuals, while the acute phase lasted, were insane; but at the beginning of the phase the diagnosis might not be so easy in default of a record of previous attacks, and when the phases were of brief duration the symptoms might be no longer obvious at the time of examination. Still greater was the difficulty when the morbid cycle was of the mild or cyclothymic type, characterized, as Kraepelin said, by frequent, more or less regular, fluctuations of the psychic state to the manic or to the depressive side. Kraepelin said that this was found in only 3 to 4 per cent. of his patients—but that it was in reality much more frequent, as it was the invariable introduction to the slightest forms of manic-depressive insanity which ran their course outside of institutions.

When the character and conduct of the individual during his normal intervals were known it was easier to decide his responsibility for misconduct. The taking of alcohol to excess was definitely a symptom in certain individuals, and these were the true dipsomaniacs. He found it quite feasible to allow certain patients out on parole without any anxiety with regard to alcohol during the quieter, or partly depressive, phase. His experience led him to agree with the views of his old teacher, Sir Thomas Clouston, that the morbid craving was coincident in a few of these cases with the period of depression, but mostly with the beginning of the period of exaltation. Alcohol certainly enhanced the mischievousness of Mr. Hyde; Dr. Jekyll had no difficulty in refraining from it as from other vicious conduct.

### Violent Conduct in Manic-depressive States

Dr. Norman said that he had noted with interest Dr. East's statement that crimes of violence were committed much more frequently in the depressive state. It was probably the excited and exalted subjects who gave the greatest amount of trouble by their mischievousness, malice, perversion of the truth, intractability, destructiveness, and so on. Those who had charge of manic-depressives welcomed with a sigh of relief the onset of the depressive phase.

The hereditary factor was important. A classical case, in more than one sense, to illustrate that point was the Emperor Nero. Two of his uncles were insane; his grandfather was a man of great arrogance, prodigality, and cruelty; his father, a man of execrable character, brutal, and regardless of the lives of others; his mother, a marked moral defective. It was little to be wondered at that Nero was mentally unstable, and his disorder was of the manic-depressive type. Incest, homosexuality, and murder were incidents in his career, which he ended by suicide at the age of 31.

The treatment of such cases was unsatisfactory. It did not appear that psychological treatment had been successful in disorders of this type. The treatment of symptoms or of the separate attacks was a different matter. Good results appeared to have been obtained by giving large doses of sedative drugs. He agreed with Dr. East that imprisonment might be the only means of protecting the manic-depressive alcoholic from himself—that is, if he did not become certifiably of unsound mind. Perhaps some arrangement might be made on the lines of the "family council," so that an individual who suffered in this way would be placed indeterminately under care until such time as he proved that he could make his conduct approximate to that expected of the normal citizen. Something might even have been made of Nero—a good violinist or a competent charioteer—had his liberty been restricted and had he been compelled to obey for a longer period the wise counsels of Seneca and Burrhus, instead of being pandered to and given unlimited power. The lesson was not without value even nowadays.

### The Rhythm Characteristic

Sir ROBERT ARMSTRONG-JONES, in contributing to the discussion, said that the relation between alcohol and insanity was too well known to need elaboration, but the relation of alcohol to a particular form or type of insanity, such as the manic-depressive form, had not yet been fully worked out. The term "manic-depressive" was unknown before Kraepelin used it forty years ago, but the condition was a well-recognized variety described in his own student days as recurrent or alternating insanity. It was referred to by Kahlbaum in 1882 as a mental disorder with two stages—namely, mania and melancholia. Falret described it as *folie circulaire*, and later authorities had described it, if the symptoms were mild, as cyclothymia. Hecker said that it was noted as an exceptional form of mental disease not followed by dementia.

Manic-depressive insanity occurred in about 15 per cent. of all cases admitted into mental hospitals, and 70 per cent. of the total cases were females. A certain rhythm was its characteristic. The elated mentality was characterized by an increased rapidity of movements, with a vivid and rapid flow of ideas, and the words used for expressing the thoughts suggested new and unexpected associations, often clever, humorous, and grotesque. The patients were unable to concentrate or to focus their attention, but sometimes they were able to sustain a reasoned argument (*folie raisonnante*). The elated mentality was succeeded after a short or long period by a phase of mental depression. They were then dull, emotionally depressed, and irresponsive; there was a retardation of most movements; and they were so slow that they might have to be persuaded to take their food. The melancholia continued until they again assumed their active and vivid personality.

The period of exaltation through which cases of manic-depressive disorder passed was sometimes described as hypomania, and it greatly resembled the mild stimulation of alcohol. Alcohol to these sufferers was a bane, a woe, a poison. They were most susceptible to it, and it should never be offered to them in the depressed stage with the object of raising their spirits. He was of opinion that alcohol was not a contributory cause of manic-depressive insanity, as it certainly was of other forms of mental disorder—for example, general paralysis. He distinguished the dipsomaniac from the mental-depressive. In dipsomania a mental state came on suddenly and was imperious and irresistible; it was a craving, first initiated by the taste and effects of alcohol, which periodically was taken immoderately until satisfaction was reached. The duration of the dipsomania was a matter of days, and that of manic-depressive disorder was a matter of months or years. The dipsomaniacs were deeply contrite, but the manic-depressives knew no regrets. There was a definite periodicity in the two states, but they were totally different illnesses. Some dipsomaniacs became mentally as well as physically deteriorated. He instanced the case of Jane Cakebread, who died at Claybury. She was convicted over three hundred times for drunkenness, but in her periodical intervals of compulsory abstinence she hated the sight of brandy!

### The Relation of Alcohol to Crime

The speaker concluded with a few remarks on the relation of alcohol and crime. It was certain that alcohol was the most potent contributory factor in the causation of crimes of violence. The temporary elation caused by alcohol meant the loss of self-control, and this favoured the outcropping of the lower instincts, often referred to as the self-regarding instincts. Alcohol impaired the judgement, disturbed the emotions, and led to conduct which was impulsive, aggressive, and dangerous. Until recently it was the attributed cause of insanity in 15 to 20 per cent. of all cases admitted into mental hospitals. This proportion had considerably diminished to-day, chiefly owing to the closer legal limitation of hours during which drink might be purchased, and he held strongly that these hours should not be extended.

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## LIPIODOL IN BILIARY SURGERY

At a meeting of the Liverpool Medical Institution on January 9th, with the president, Dr. C. O. STALLYBRASS, in the chair, Mr. J. COSBIE ROSS read a paper on lipiodol in the surgery of the biliary passages.

Mr. Ross said that in his own series of 110 operations on the biliary tract the ducts were explored on twenty-seven occasions ; in sixteen of these stones were removed from the ducts as well as from the gall-bladder. Three of the twenty-seven explorations of the ducts were conducted through the stump of the cystic duct, and in six cases the bile duct was sutured after exploration. On seventeen occasions a catheter was stitched into the duct for various reasons, usually where numerous stones had been removed or where infection was present. He explained the difficulty of being sure that the ampulla of Vater was patent when the operation had to be concluded rapidly in view of the poor condition or advanced age of the patient. Again, when much thickening due to pancreatitis was present, it was not always possible to be certain that a small stone was not being overlooked in the region of the ampulla. It was in the post-operative management of cases such as these that the lipiodol method was of value. The usual tests of the patency of the common bile duct were fallacious, since the stools might be bright-coloured in spite of the patent ampulla, where there was suppression of bile. Again, all the bile might be discharged through the tube, giving light-coloured faeces in conjunction with a patent duct. The actual technique was easy and without danger if care was taken to avoid injection under pressure ; 20 c.cm. of warmed lipiodol was injected into the catheter draining the common bile duct about nine days after the operation. An immediate *x*-ray examination revealed the greater part of the lipiodol already in the duodenum. Biliary dyssynergia or spastic dyskinesia might retain the lipiodol in the ducts for from twenty minutes to three hours, but the condition responded to the hypodermic administration of atropine, following which the lipiodol passed on into the duodenum. In these cases lipiodol secured a positive diagnosis of biliary dyssynergia, and the timely administration of substances to relax the choledochal sphincter might prevent the occasional case where biliary colic and post-operative symptoms caused disappointment after cholecystectomy. The tube draining the common duct should not be removed before the patency of the biliary tract had been demonstrated by lipiodol. In this way valuable information could be gained in cases where further measures were contemplated, and such disasters as bile peritonitis, due to superficial premature closure of a biliary fistula in the presence of a blocked ampulla, might be avoided.

Mr. H. V. FORSTER thought that the less viscid neoiodipin had been found more suitable, for example, in the radiography of the ducts of the parotid. Dr. E. T. BAKER-BATES, who had used lipiodol very frequently in lung conditions, said that he gave small doses of potassium iodide for a week before its introduction as a test for iodism. Furthermore, as Sicard and Forestier had pointed out, lipiodol was acted upon by alkalis, leading to the liberation of free iodine, which produced iodism. In their opinion iodism only occurred if much lipiodol had been allowed to enter the gastro-intestinal tract, where free iodine was liberated by the alkaline pancreatic juices. They had recommended that the stomach should be screened as a routine to demonstrate the presence or absence of lipiodol in the stomach. If small amounts were present a saline aperient would prevent absorption ; if large amounts were present an emetic should be given. In the speaker's experience symptoms of iodism occurred in cases where large amounts of lipiodol had entered the stomach ; it was very interesting and instructive to note that in Mr. Ross's series no cases of iodism had been encountered, in spite of the iodized oil being introduced into the bile passages and duodenum, and without any previous exclusion of iodide idiosyncrasy. The relative immunity in these cases was probably related to the rapid passage of the oil along the duodenum and to its never having been in the stomach.

### Bronchial Carcinoma

Dr. E. T. BAKER-BATES, in a paper on some aspects of bronchial carcinoma, said that there had been a growing suspicion that it was increasing in frequency. There were, however, fallacies inherent in the existing statistical tables relating to the incidence, which were based upon the rise in the curves representing the ratio between the actual cases coming to post-mortem examination and the total number of necropsies performed. The hospital population could not be taken as representative of the community. The curve of incidence of primary lung carcinoma showed no marked increase when the disease was calculated in terms of the total annual admissions of patients to hospital ; this was more than double that of the pre-war period. If the annual admission list was taken a more reliable criterion as to the incidence would be obtained. There were undoubtedly more cases seen than twenty-five years ago, but the increase was not so great as the records hitherto available had claimed. The increase was explained partly by the interest which has been excited in bronchial carcinoma in recent years and partly by improved methods of diagnosis. The mode of onset and clinical features were discussed in detail ; the occurrence of haemoptysis, pleural effusion, and localized infection within the chest as the first manifestation frequently altered the evolution of the condition. The onset of paroxysmal dyspnoea might simulate asthma. The syndromes of mediastinal obstruction and metastasis were considered in relation to the speaker's series of cases. Clinical examination in the early cases might reveal no physical signs. With the collapse of the lung which followed stenosis of a main bronchus the heart and trachea were displaced towards the affected side, a most suggestive sign. Later, dullness on percussion and diminution of the breath sounds, with reduction in the hemidiaphragmatic movements, were the commonest sequence of events. The value and limitation of direct radiology was next discussed. The examination might be completely negative if the growth was confined to the lumen of the bronchus, or if it was retrocardiac. Later, the shadows cast by collapse of the lung and the suppuration following bronchial obstruction might obscure the picture. The value of lipiodol in the early diagnosis and in pleural effusion after air replacement was considered. It indicated the upper margin of the growth, and showed the extent of the intrabronchial growth (rat-tailed bronchus). The outline of the growth was nearly always convex. Fusiform narrowing was probably due to chronic inflammatory changes. Dr. Baker-Bates had never seen any deleterious effects following its use. In his experience the value of bronchoscopy in the early diagnosis and treatment could not be overestimated, but the co-operation of a laryngologist and physician was essential. The technique had now been mastered sufficiently to permit this method of examination being performed under local anaesthesia with ease and without discomfort to the patient. Bronchoscopy added a certainty to the diagnosis which could not be obtained in any other way, by giving information as to the site and extent of the lesion, and enabling tissue to be removed for section.

If any successful treatment could be evolved its success would depend upon the earliest possible diagnosis; one should therefore be prepared to investigate with the bronchoscope all patients presenting any of the recognized manifestations of the disease. Patients with advanced bronchial carcinoma suffered from the mechanical effects of a blocked bronchus. The introduction of radon seeds kept a patent lumen, and made the lives of these patients far more bearable by allowing bronchoscopic drainage and preventing suppurative complications. The duration of the disease depended upon whether the patient had a patent bronchus or not. If the bronchus was occluded the course of the disease was rapid, death occurring from inflammatory changes in the "drowned lung," which formed a suitable nidus for pneumonic consolidation and abscess formation. When the growth remained extrapulmonary the progress was slow, the patient living in comparative comfort for a couple of years. Deep *x*-ray therapy was often palliative. If there were large mediastinal glands producing mediastinal obstruction the symptoms were markedly relieved. *X* rays did not appear to have any influence on the primary growth in the bronchus.

Dr. A. ADAMS said that since the foundation of the tuberculosis service the voluntary hospital rarely saw pulmonary cases. This was well illustrated in the figures published by the department in Manchester, where in 1932 there were recorded 138 deaths from cancer of the respiratory system and eighty-nine cases of pulmonary carcinoma, almost all of bronchial origin. The Manchester area appeared to be the most fertile source of this disease in the kingdom, thus approximating to the mining districts of Czechoslovakia and Saxony. Severe haemorrhage was a rare complication, but staining of the sputum occurred in about 40 per cent. of cases at some period. The symptoms and physical signs found in the chest were usually caused by occlusion of a bronchus or by pressure. Metastases in the central nervous system were more frequent than the published reports suggested. The type of disease described by Continental physicians as "lymphangitis carcinomatosa" had been missed by many clinicians, the *x*-ray appearance being misread as miliary tuberculosis. The recent work of Dudgeon and Wrigley on the finding in the sputum of groups of malignant cells was a valuable addition to the clinical examination. Lipiodol for demonstrating the presence of a growth should be used with great care, as it might prevent a patient later being submitted to deep-therapy treatment, and was usually not necessary for diagnosis.

Professor HENRY COHEN emphasized the fact that nearly 25 per cent. of all cases had an acute pneumonic or pleural onset. Occasionally the radiological features of miliary tuberculosis were so closely simulated by carcinoma that only by post-mortem examination could a diagnosis be established. Nearly 10 per cent. of all cases had a positive Wassermann reaction, though pathological examination proved the lesion to be malignant; the association of tuberculosis with malignancy was by no means infrequent. "Unresolved pneumonia" was a seductive, though dangerous, phrase; while the radiologist might be justified in using it, the physician should recognize the possibility of an underlying carcinoma in all such cases. A special technique might reveal the presence of malignant cells in the sputum, though a negative finding was of no value. Three of the cases of proved bronchial carcinoma under the speaker's care had as their main symptom intense lumbar pain, although there was no radiological evidence of metastasis; later the pain radiated up the spine to the neck. The possibility of metastases giving no radiological signs of their presence was offered as an explanation, although no opportunity for confirmation by post-mortem examination had been afforded in these cases. The superior pulmonary sulcus tumour described by Pancoast was in most instances a bronchogenic carcinoma at the pulmonary apex. He had seen many cases of generalized metastases from a primary carcinoma of the bronchus so small that no clinical or radiological evidence of its presence existed during life. All the patients he had referred to surgeons had died within twelve months of the operation with one exception, that of a man with a pedunculated carcinoma removed from the right main bronchus who was alive and well two years later. *X*-ray treatment and radium had given very disappointing results.

Mr. H. V. FORSTER, speaking from the point of view of the endoscopist, referred to the explanation of V. E. Negus of the brassy cough caused by narrowing of the trachea or large bronchi. This narrowing gave rise to a primitive vocal organ comparable to the syrinx found at the tracheal bifurcation in birds. Referring to the diagnostic value of bronchoscopy, it had been suggested by the late Dr. Sydney Yankauer that in all cases of haemoptysis in which tubercle bacilli could not be found bronchoscopy should be performed, and that the endoscopist should encourage the physician to look upon this useful direct method as one not carrying a great risk. In treatment the endoscopist would appreciate from Dr. Baker-Bates's paper that he could help to relieve pulmonary collapse due to bronchial narrowing. With regard to the treatment of the primary disease, he had been able once to remove to a considerable extent with punch forceps a growth involving the left main bronchus, with subsequent restoration of ventilation. He understood that Mr. Ormerod, at the Brompton Hospital, now preferred to use a tube-like radon container kept in place by a spring device, and permitting pulmonary ventilation whilst *in situ*. The question whether deep *x*-ray therapy could be helpful appeared to have been answered favourably by many observers in America. Some patients had experienced relief over periods up to five years.

Dr. P. H. WHITAKER stressed the importance of screen examination in radiography of cases of early bronchial carcinoma. Since the radiological signs of bronchial carcinoma depended upon partial or complete obstruction of the bronchus it was often possible to defect deficient air entry, before it became clinically apparent, by the limitation of diaphragmatic movement on the affected side. Further diagnosis was helped by lipiodol injection and bronchoscopy. With regard to treatment by irradiation, the obvious reason why the results were so poor in all hands and at the best only of a palliative nature was the difficulty of access, coupled with the fact that a large enough dose could not be at present directed on to the tumour. It could only be hoped that in the future there would emerge some way of applying radiation directly to the tumour itself, without irradiating the remaining portion of the lung. Dr. HOWELL HUGHES said that from the surgical point of view four main types of bronchial carcinoma could be classified according to radiological and bronchoscopic findings. (1) In intrabronchial carcinoma the early radiological appearance was a slight increase in the shadow of one hilum; later there was bronchial obstruction, a dense wedge-shaped shadow spreading from hilum to the periphery. (2) The mediastinal type spread from a large bronchus into the mediastinum, but not peripherally, increasing the mediastinal shadow. (3) The peripheral type spread outwards, and might invade the chest wall, while the mediastinal glands were not involved. Radiologically an almost round shadow was seen in the lung, making contact with the hilum. Pancoast's tumour, described by Professor Cohen, was probably of this type. Merely because of its position and size it had caused the complications described, and so did not justify being classed as a separate group. (4) The parenchymal type showed radiologically a rounded shadow in the lung distinct from the hilum, with late glandular involvement. Treatment in Types 3 and 4 might be by lobectomy or pneumonectomy, but in Type 1 treatment would only be palliative, to relieve obstruction by the use of radon seeds.

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*A Report on Two Experimental Fire-Walks*, by Harry Price, has now been issued by the University of London Council for Psychical Investigation. Copies can be obtained from the Secretary of the Council (13D, Roland Gardens, South Kensington, London, S.W.7) at 5s. net. An account of the fire-walking experiments was published in the *British Medical Journal* of September 28th, 1935 (p. 586).

# Australia

[FROM OUR CORRESPONDENT IN SYDNEY]

### International Pacific Health Conference

The second International Pacific Health Conference was held at the School of Public Health and Tropical Medicine, Sydney, from September 3rd to 6th, 1935. Among the representatives at the Conference were those of the League of Nations, China, Japan, New Zealand, Papua, New Guinea, the Federated Malay States, and the provinces of Australia. In addition a number of officers of the health departments of the Commonwealth of Australia and the Territory of New Guinea, and of the School of Public Health and Tropical Medicine, Sydney, attended and contributed to the discussion. Dr. J. H. L. Cumpston, Director-General of Health of the Commonwealth, presided, and the Conference was opened by Sir Charles Marr. The subjects discussed included: diseases of special importance in the zone; diet in relation to climate, race, work, health, and survival; features of health and medical services under the varying conditions of administration; native medical education; and prospects of profitable co-operation within the zone. Papers were read on leprosy, malaria, framboesia, filariasis, tuberculosis, leptospirosis, and endemic typhus. Dr. E. J. Brennan, who dealt with prophylactic measures against malaria in New Guinea, pointed out that excellent results had been achieved by the introduction of the larvivorous fish, *Gambusia affinis*, into known anopheline breeding places in the neighbourhood of native villages. This procedure was undertaken because of the difficulties of drainage and of other anti-malarial measures in places distant from towns and European communities. There was a striking difference between the spleen rates in villages that had been provided with gambusia and those that had not. Perhaps more interesting still was the fact that in certain treated villages the birth rate exceeded the death rate for the first time on record. Dr. Brennan also mentioned that in the Territory of New Guinea quinine was preferred to atebrin in the early stages of a severe attack of malaria. In a discussion on yaws Dr. W. M. Strong remarked that injection of bismuth salicylate suspended in olive oil was a method of treatment in general use in Papua. He favoured this method because it was less dangerous in the hands of partially trained persons. It was found to result in clinical cure in 90 per cent. of cases. The discussion on native medical education was of considerable interest. The methods of training native medical practitioners, orderlies, and assistants, and their value to the individual communities, were described.

### Health and Milk Week

The activities of the New South Wales Annual Health and Milk Week have grown so much that they can no longer be compressed into the space of seven days, and the week has expanded to a fortnight. The object of Health Week (to give it its shorter title) is the promotion of public health by the encouragement of hygienic habits. The programme includes an annual intensive educational campaign; lectures and broadcast talks by medical men, dentists, and others; athletic and sporting displays; the inspection by the public of health centres; conferences of hospital matrons, secretaries, auxiliaries, etc.; stage presentations of educational value in matters of health; and a procession in the streets of Sydney. An excellent booklet of 128 pages, containing authoritative information on many subjects relating to health, is issued free; this is a readable, interesting, and instructive work. The chairman, vice-chairman, and members of the executive committee are all eminent persons, well known for their public activities and for their interest in the public health. The general committee comprises representatives of over ninety organizations, and these organizations play their part in the Health Week and help to bring the campaign to the notice of all sections of the community. The amount of good work done by the committee of Health Week is difficult to estimate, but it is safe to assert that if it did no more than distribute its booklet it would still perform a valuable public service.

# England and Wales

### King Edward's Hospital Fund

At a meeting of the General Council of King Edward's Hospital Fund for London on January 14th, with Sir Frederick M. Fry in the chair, the following message from the Prince of Wales, President of the Fund, was read:

"I am sorry to have to inform the Council that Sir Leonard Cohen has felt obliged, after his recent illness, to ask to be relieved of the chairmanship of the Hospital Economy Committee. To the work of that committee, which is very useful but largely technical, he has devoted a great amount of his time and his ability for the last fourteen years. Happily, he will continue to act as an honorary secretary, and therefore as an *ex-officio* member of most of the committees, including the Management and Distribution Committees, and, of course, as a member of the Council. I have appointed Mr. F. W. J. Jackson chairman of the Hospital Economy Committee, and, as such, a member of the Management Committee."

A resolution was adopted on behalf of all connected with the King's Fund expressing deep regret at the death of the Marquess of Reading, who had been a member of the council since 1929, and the sense of the great loss which the Fund has sustained thereby.

### International Congress of Physical Medicine, London, May, 1936

The sixth International Congress of Physical Medicine, as already announced, will meet in London from May 12th to 16th. Lord Horder has accepted the office of president of the British section; Sir Robert Stanton Woods is chairman of the executive committee; Sir Henry Gauvain, chairman of the general committee; Dr. Albert Eidinow, honorary secretary; and Dr. Alexander Cawadias, honorary assistant secretary. The congress will consist of full members and associate members. Full members will be fully qualified medical practitioners who have paid their subscriptions. Associate members will include medical students, members of the Society of Radiographers, Bio-physical Assistants, State-registered nurses, and members of the Chartered Society of Massage and Medical Gymnastics. The Executive Committee reserves the right to accept or refuse any proposed members. The wives of members will be entered as honorary associate members. Associate members will be allowed to attend scientific meetings and the exhibition of medical apparatus, but they will not take part in discussions. The fee for each full member of the British section is £2 2s. and for associate members 7s. 6d. The fee for full members from abroad is 250 Belgian francs, and for associate members from abroad 100 Belgian francs. There will be six sections of the congress: (1) Kinesitherapy, (2) Physical Education, (3) Hydrotherapy and Climatotherapy, (4) Electrotherapy, (5) Actinotherapy, (6) Radiotherapy and Radium Therapy. Members wishing to submit papers must send them, typewritten, not later than March 15th. The official language will be English, but papers written in French, Italian, or German will be received. All papers must include a short typewritten summary. Medical men and women wishing to take part should communicate with Dr. Eidinow, 4, Upper Wimpole Street, W.1.

### Leeds University: Annual Report

In the annual report of Leeds University it is pointed out that the scheme of building reconstruction has reached a stage when a plan for the further extension of the educational resources of the university may be envisaged for the coming year. It is hoped that the erection of the Students' Union building will be started in the forthcoming session. The transference of the library to new premises will take place during the spring vacation. "The number of students in attendance at the university showed a decided increase over that of the previous year, especially in the Faculty of Medicine." "A beginning has been made on a programme of research into the causes and cure of rheumatism." The report records a consistently successful academic year.

# CORRESPONDENCE

## The Poisons Rules

SIR,—My attention has been drawn to a letter from Sir E. Graham-Little contained in your issue of January 18th about Rule 29 of the Poisons Rules recently made by the Secretary of State under Section 23 of the Pharmacy and Poisons Act, 1933, which suggests that the Rule interferes with the compounding and dispensing of medicines by medical practitioners.

In the course of his letter Sir E. Graham-Little says that "Rule 29 enacts that the substances which such medical practitioners can supply are to be limited to certain glandular products cited in the Rule," that when the Rules come into operation on May 1st next "the medical practitioner will be debarred from supplying preparations containing any of the poisons scheduled," and that as a result of the Rule medical practitioners will be "deprived . . . of their present right to compound or supply medicines containing drugs so commonly used as, for example, the barbiturates."

Sir E. Graham-Little has clearly misunderstood the terms and effect of the Rule. Rule 29 is made under Section 23 (1) (i) of the Act, which gives power for Rules to be made "for requiring persons in control of the manufacture of pharmaceutical preparations containing poisons to be registered pharmacists or persons possessing the prescribed qualifications in chemistry." The application of Rule 29 is limited to "establishments in which pharmaceutical preparations containing any poison are manufactured for the purpose of the internal treatment of human ailments." The Home Office is advised, and it seems to me quite clear, that the Rule does not apply to the "compounding" by a medical practitioner of his own medicines (Section 23 (i) (*f*) confers on the Secretary of State a specific power—which has not been exercised—to make Rules in respect of the "compounding" of poisons), nor has it anything whatever to do with the supply of medicines by a medical practitioner to his patients. The Rule leaves absolutely unaffected the exemption conferred under Section 19 in respect of the supply of a medicine by a duly qualified medical practitioner for the purpose of medical treatment.—I am, etc.,

Home Office, S.W.1, Jan. 21st. GEOFFREY LLOYD.

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SIR,—There has been so much misunderstanding concerning the meaning of the new Poisons List and Rules and their effects that it seems desirable to draw attention to certain interpretations of the Rules which Sir Ernest Graham-Little adopts in his letter which you published last week, and which appear to me to go beyond what can be maintained by the strict wording of the Rules.

The Pharmacy and Poisons Act, 1933, by S. 23 (1) (i) gives the Secretary of State power to make Rules requiring persons in control of the manufacture of pharmaceutical preparations containing poisons to be registered pharmacists or persons possessing the prescribed qualification in chemistry. The Poisons Board recommended (Draft Rule 27 on page 51 of its report) that a Rule should be made in the following form:

> "In all establishments in which pharmaceutical preparations containing any poison are manufactured for the purpose of the internal treatment of human ailments the preparations shall be manufactured by or under the supervision of: (*a*) . . . (*b*) . . . (*c*) a duly qualified medical practitioner . . ."

In his official Rules the Home Secretary has recast the draft and has altered (*c*) to the extent of limiting the preparations which may be manufactured by or under the supervision of a medical practitioner to preparations containing certain glands and their active principles. Whether or not this limitation of the supervision which medical practitioners may exercise in manufacturing establishments should meet with the approval of the British Medical Association is, of course, a matter of policy upon which it is not for me to express an opinion. Sir Ernest Graham-Little says, however:

> "The revised version dealing with medical practitioners, in Rule 29, enacts that the substances which such practitioners can supply are to be limited to certain glandular products cited in the Rule. . . . On May 1st, 1936, the medical practitioner will be debarred from supplying preparations containing any of the poisons scheduled—a long list including many drugs commonly used—unless he is, or becomes, a Member of the Pharmaceutical Society. . . ."

This surely cannot be so, since Rule 29 deals specifically with manufacture, and says nothing whatever about supply. Later he says:

> "It is all the more extraordinary that medical practitions should be deprived, as the new Rule would require, of their present right to compound or supply medicines containing drugs so commonly used as, for example, the barbiturates."

Here again it must be repeated that the Rule does not deal with compounding or supplying. It is restricted to "establishments in which pharmaceutical preparations containing any poisons are manufactured . . .", a phrase which is intended to, and in my view clearly does, refer solely to manufacturing laboratories, and has no applicability to a doctor's dispensary or to a chemist's shop.—I am, etc.,

HUGH N. LINSTEAD,
Secretary, Pharmaceutical Society of Great Britain.

Bloomsbury Square, W.C.1., Jan. 20th.

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## Treatment of Pneumonia

SIR,—Several articles have appeared recently in various medical journals on the treatment of pneumonia. I should like to mention one point which, to me, never seems to be sufficiently emphasized in either textbooks or hospital teaching—that is, the ill effect the journey has on a patient when moved to a hospital or nursing home. This is not easily appreciated in the earliest stages, but later on the effect is dramatic. How often has it been the experience of house-physicians to admit cases to hospital only to find them moribund on arrival? The tendency is to place the blame on the general practitioner for sending the case up in such a condition, and yet, had the house-physician seen how fit the patient appeared at home before removal he would have been astonished.

The reason why this point is so frequently overlooked may be found, I think, in the fact that when a case is admitted to hospital it changes hands, and no one person has complete charge from start to finish. By carrying this argument a stage further the conclusion may be drawn that hospital treatment is never indicated. This, of course, is not so, home conditions and nursing difficulties often being such that the harassed practitioner has no alternative. Nevertheless, I consider that a case should only be moved in the very early days, and then after careful consideration of these details. In the later days the advantages of hospital treatment over poor home conditions and the like are, only too often, completely nullified by the bad effect of the journey.

In corroboration of the remark made by Professor Wynn in his recent lecture to the Norfolk Branch (*Journal*, January 11th), I have heard several authorities mention that true classical pneumonia is almost a rarity nowadays compared with the number of cases seen formerly.—I am, etc.,

Royal Arsenal, S.E.18, Jan. 13th. A. L. LEIGH SILVER.

## Fire-walking

SIR,—No one denies that emotional excitement may render one insensitive to pain, but this will not protect from burning either the dead horny outer layer of the skin or a small piece of strapping stuck on to this. The walking on hot stones observed by my friend Sir James Purves-Stewart was carried out in a pit about 12 ft. wide. This is about the distance covered by Kuda Bux walking on a trench filled with hot embers and charcoal. Such a distance is easily walked in about four seconds, the time taken by Kuda Bux. Each foot may then be in contact for about one second at each step and for two seconds in all. Now I find I can press my heel on a glowing thick stick of charcoal for about five seconds before feeling any sensation of pain, and the ball of my thumb, hardened by gardening, for a second or two. Glowing charcoal and embers the outer layer of which is charcoal have a low heat capacity and low conductivity for heat; contact with the foot cools the outer layer and makes it temporarily cease to glow.

In the case of the stones we are told that bits of paper caught on fire when they fell between the stones. The surface cooled by the air must have been less hot. What the heat capacity and conductivity of the stones were we do not know. Those who walk barefoot have feet equably covered with horny layer and far less sensitive to pain than those who go shod. The ground layer heated by the tropical sun is often hotter than a European can bear to touch. The skin of the native's feet must become hardened to this. The English amateur fire-walkers were heavy men hesitant in their walk. Kuda Bux was of light weight and walked confidently. But the fire trench was too hot for him to make more than two brief walks.

Dancing through a fire while wet with sweat, or lifting up hot embers and putting them in the wet mouth or in the armpit wet with sweat, is not contrary to physical explanation. The time limit is most important in such operations. We know that the skin is so protected by its moisture that a man can safely plunge his arm in and out of melted lead. The sweat under a skin of wax protects the patient who keeps his limb for twenty minutes in a wax bath at 130° F. Maskelyne, the eminent conjurer, knows how to eat fire, and supplied the Navy with a material which, spread over the face and arms, protected the gunners from the burning heat of the great guns.

In addition to fire-walking Kuda Bux claims to be able to stop his pulse at the wrist at will, but any physiologist can do this by a forcible expiratory effort with the mouth and nose held shut. He also claims to be able to see with the end of his nose, but the method he used for closing his eyes—namely, by a pad of dough and a bandage—did not preclude the making of facial movements which would allow him to see down the side of the nose.—I am, etc.,

LEONARD HILL.

The St. John Clinic, London, S.W., Jan. 19th.

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SIR,—Further to the interesting article by Sir James Purves-Stewart and Professor David Waterston in the *Journal* of December 28th, 1935, and to Dr. A. G. Thompson's letter of January 11th, on the subject of fire-walking, I feel that the following points may be of interest.

Fire-walking has been practised for very many years as a trick in various parts of the world. Although it is an asset to have fairly tough-skinned feet, this is not essential. Various solutions have been used to prepare the feet, and the following is one with which the late master magician Houdini was familiar. "A saturated solution of alum in one pint of water is made and to it is added about a quarter of a drachm of pink sulphate." The feet are soaked in this and allowed to dry, several times, and any superficial crystals are brushed off. It is then difficult for even a careful observer to detect signs of this process, which considerably toughens the skin.

I am not suggesting that the whole explanation of the Fijian ceremony lies in a method such as this. One of the members of the party who watched the exhibition tells me that in his opinion the soles of the performers' feet were considerably keratinized and tough. He also observed that many of the hot stones on which they walked were quite acutely rounded on the upper surface, so that the apposition of foot to stone may possibly have amounted almost to "point contact." We are all familiar with one's ability to pick up a very hot plate if its edges at two diametrically opposed points are pressed tightly between the outstretched palms. Other relevant experiments are (i) to boil water in a paper bag over a naked flame, and (ii) to stick a piece of paper to the perfectly smooth bottom of a saucepan and then to heat water contained in it. In neither case does the paper burn or char. The tight apposition in the one case between paper and water and in the other between paper and metal allows the heat to be conducted rapidly through the medium without appreciably heating it. Moreover, it takes some time for the water inside to get really hot. If this principle is applied to the feet of fakirs or others it will be seen that the heat from smooth hot stones is rapidly conducted to and distributed among the internal structures of the foot without greatly heating the skin, and, where the area available for heat conduction approaches to point contact, the total quantity of heat transmitted is quite small. It is especially small when the contact is only for a few seconds.

These facts may help to explain why there is an absence of blistering or tissue necrosis in the performers' feet, and why the cutaneous sensibility to burning cigarettes and pin-pricks is within normal limits. While it is not disputed that hypnosis may result in atypical reactions, it is nevertheless a fact that the majority of Eastern mysteries have been reproduced by Western magicians, either by clever deception or by the adaptation of some little-realized general principle. The raising of the pain threshold following repeated painful stimulation, so clearly pointed out by Professor Waterston, may reasonably be placed as an adjuvant factor with the above explanation.

Though interested in auto-suggestion and the cult of Yoga, which Dr. Thompson brings forward, I feel that the explanation of fire-walking is mainly, at least, on a much more material plane than many of us would like to believe. If inquiry should be made as to whether this practice has been indulged in by myself, the answer is "No."—I am, etc.,

ANTHONY G. PALIN.

Edinburgh, Jan. 14th.

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## Cancer in the Far East

SIR,—You publish in the current number of the *Journal* (January 18th, 1936, p. 103) a short note on the investigations of Dr. F. L. Hoffman on cancer in the Far East, in which it is stated that cancer of the penis is uncommon in Chinese men. Any of my colleagues who have worked in North China will be able to contradict this statement. In a small hospital in Peking I had three cases as in-patients at the same time. I have not seen one in private practice in England for eight years.—I am, etc.,

D. S. BRYAN-BROWN.

London, N.16, Jan. 20th.

## The Malaria Epidemic in Ceylon

SIR,—In the *British Medical Journal* of November 23rd, 1935, which unfortunately I only got a few days ago, I found a report of my remarks made at the meeting of the Royal Society of Medicine on November 15th, when the malaria epidemic in Ceylon was discussed. I am sorry to see that this report is misleading, and does not represent what I actually said. That it is misleading is proved by a letter of a colleague in India which I received, together with a cutting from the *Ceylon Daily News* of December 7th, 1935, a few days ago. In this newspaper your report was reprinted, and, as my friend informs me, greatly perplexed the medical circles which know my work.

There are two outstanding errors in the report which account for this misunderstanding. (1) I am alleged to have said that " it was only natural that in such an emergency [the epidemic], routine methods of *quinine administration* should be chiefly employed." The mistake here is the insertion of the italicized words, which implies that I recommended quinine administration. Actually, it is obvious that to-day the use of atebrin by mouth is the well-proved routine method under all conditions. (2) I am further quoted as saying: " During an epidemic the use of atebrin must be restricted to those cases which were treated under institutional conditions." This is incorrect as I was referring only to atebrin *musonat*, a special salt of atebrin which is given *by injection*, and not to the ordinary atebrin preparation which is given *orally*, and the use of which is by no means restricted to institutional cases.

I append a short correction, and should be extremely grateful if you would publish it.

Professor Schulemann of Düsseldorf said that he understood quite well that in the overcrowded hospitals the overworked physicians could make only incomplete observations, and that, as Dr. Briercliffe and Colonel Gill stated, it was impossible to draw any definite conclusions from these hospital and field experiments. Atebrin musonat, the new atebrin salt for parenteral use, was at that time in the trial stage, and for this reason not suitable for mass experiments, but only for use in hospitals. He was, however, sorry to note that the exaggerated idea of using atebrin musonat as a panacea in all cases had caused the peroral treatment of atebrin—which was so well founded—to be relegated into the background. Suitable administration of atebrin had availed to reduce the relapse rate and to prevent sequelae. A treatment combining atebrin and plasmoquine, the drugs being given according to a strict schedule on certain days of the week, was very promising. But where there was a floating population it would be advisable to give atebrin alone.

—I am, etc.,

W. Elberfeld, Germany, Jan. 9th. W. SCHULEMANN.

*** Our reporter had some difficulty in following Professor Schulemann's English, and at the end of the meeting was unfortunately unable to obtain from Professor Schulemann a copy of his remarks.—ED. *B.M.J.*

## Dorsal Plaster Sores

SIR,—Mr. Watson Jones's remarks about plaster sores and their prevention in the *Journal* of January 18th prompt me to write this letter. These sores, when due to pressure and not neuropathic in nature, can be avoided or prevented by the use of sheet sponge rubber of, say, an inch thickness between plaster or frame and skin. For some years this substance has been used for saddle panels by a well-known saddler in the Midlands. It would be out of place for me to discuss its general merits or disadvantages. At the same time it is noteworthy and important that saddle galls—which are essentially pressure sores—do not appear on backs where panels of sponge rubber are used.—I am, etc.,

Bourne, Jan. 20th. W. B. R. MONTEITH.

## Voluntary Euthanasia

SIR,—Dr. R. A. Fleming says, in your issue of January 11th, that the Voluntary Euthanasia Bill would grow to include provision for the killing of incurables, lunatics, and the very old. This will follow, says he, " once the law permits the command ' Thou shalt not kill ' to be broken." Is he not conveniently forgetting the permission given by the law for the killing of murderers, traitors, and soldiers?

Can it not be agreed that euthanasia-giving has been practised for years? Then lawyers would adjust the law to the custom. They should be firmly told by the great body of honest doctors that the present state of the law is discreditable. Every doctor knows that only a sadist, a fool, or a coward would try to prolong life under all circumstances without exception. Must we be prevented by disingenuous arguments from having the exceptions defined?—I am, etc.,

WILLOUGHBY CLARK, M.R.C.S.

Llanbradach, Glam, Jan. 13th.

SIR,—Truly the question of voluntary euthanasia is complicated. One cruel issue which will almost certainly result from legalization is this. An incurably ill patient is suffering intense pain. For himself he is quite willing to endure the agony. Even during the worst tortures there are brief intervals of happiness, as even a decrease in pain may be relatively a pleasure ; still, the patient knows that he is being a burden to his loved ones, who are certainly sharing his agony. If the agonized patient knows that he alone can cut short their mental suffering by consenting to, or perhaps suggesting euthanasia, he will find himself faced with a hideous dilemma: he must either be so selfish as to discard euthanasia and let his dear ones suffer, or, by being generous, he must bid farewell to those last sweetest, still hopeful, moments of life. Heroes and generosity are much commoner than one is apt to believe. Legalization of voluntary euthanasia might make England a land unfit for heroes even to die in.—I am, etc.,

January 17th. A. E.

## VITAL STATISTICS FOR ENGLAND AND WALES, 1935

We are indebted to the Registrar-General for the following statement regarding the provisional birth rates and death rates, and the rates of infantile mortality, in England and Wales and in certain parts of the country, during 1935. The statement is issued for the information of medical officers of health.

*Birth Rate, Death Rate, and Infant Mortality for the Year 1935*
*(Provisional Figures)*

| | Live Births per 1,000 Population | Deaths per 1,000 Population (Crude Rate) | Deaths under One Year per 1,000 Registered Live Births |
|---|---|---|---|
| England and Wales ... ... | 14.7 | 11.7 | 57 |
| 121 county boroughs and great towns, including London | 14.8 | 11.8 | 62 |
| 140 smaller towns with estimated resident populations of from 25,000 to 50,000 at 1931 Census | 15.1 | 11.4 | 55 |
| London (administrative county) | 13.1 | 11.3 | 58 |

The birth and death rates for England and Wales as a whole are calculated on the estimated mid-1935 population, but the remaining rates are calculated on the estimated mid-1934 populations.

The 1935 birth rate is 0.1 per 1,000 below that of 1934, and is 0.3 above that of 1933, the lowest recorded.

The crude death rate is also 0.1 below that for 1934, the only years with a lower or similar record being 1923 (11.6), 1926 (11.6), 1928 (11.7), and 1930 (11.4).

The infant mortality rate is the lowest recorded, the previous record years being 1934 (59) and 1930 (60).

# KING GEORGE THE FIFTH

## "Our Most Illustrious Doctor"*

The life of a monarch touches every side of the life of his people, kingship being the most catholic of professions, and therefore, in reviewing a reign, to take one aspect only and divorce it from the rest is to do some violence to contemporary history. But King George's qualities as a ruler, his political wisdom, his initiative in conciliation, his felicitous expression of the common sentiment, his patronage of learning, arts, and sport, have already received abundant testimony from every quarter, and in these pages it seems most fitting to place on record his various contacts with medicine and nursing and hospital service, and his grasp, which was almost that of an expert, of the problems of public health.

To some extent his interest in these subjects was inherited, for the name of his father, King Edward VII, is written large in the hospital development and the social reform of his period. But King George, without doubt, was drawn to this field of human endeavour by the simple instinct of a kindly nature which made him the most popular and the least formidable of sovereigns. Medicine enlisted his interest, not merely because it was one of the great professions which the occupant of the Throne may be expected to patronize, but because he saw in it an ordered service for the relief of suffering and for research into the causes of disease. It appealed to the sympathies of a very human King. On many occasions he went out of his way to do honour to the profession and to show special courtesy to individual members of it. He had no hesitation in disarranging an official programme in order to bring in a visit to a hospital or other organization of mercy, and to encourage those concerned in carrying it on, and in his interest in this field of work he was seconded on all occasions by the Queen, herself the President of the British Red Cross Society, who has never wearied in well-doing.

### The King and the Medical Profession

Almost the last public speech which the King made in London was immediately after the Silver Jubilee celebrations, when he opened the British Post-Graduate Medical School at Hammersmith. On that occasion he expressed once more his gratitude "for the skill and care which I and my family have received from members of the medical profession, and not least from the distinguished members of the Governing Body of this School"—a reference to some members of his own Medical Household. These his last words to a predominantly medical gathering were only an echo of one of his early speeches made as Heir Apparent in 1903, when he presided at a festival dinner of Epsom College, an institution which was opened by his grandfather, the Prince Consort, in 1855, and which received always the active interest of King Edward. It is characteristic of the thoroughness which marked the future King George throughout life—as those who conducted him around institutions or exhibitions were well aware—that he was not content to preside at the dinner without having first visited the College, which he did on the previous day.

The speech of the then Prince of Wales, even after the lapse of a third of a century, is worth extended quotation. He began by remarking that he was already president of five large London hospitals, so that he knew the splendid services rendered by the medical profession to those institutions. As president of the King Edward's Hospital Fund for London also he realized that valuable time and experience were devoted by members of the profession to the assistance of that fund, especially in the all-important work of visiting and reporting upon hospitals desirous of receiving help. He continued with these words, which the *British Medical Journal* at the time described as simple, direct, and manly, having a note of conviction which gave them eloquence in a way that more ornate phrasing could never have done:

> "I feel I am uttering a mere commonplace in stating that we all owe a debt of gratitude to the doctor—we cannot get on without him. He is with us on our entry into the world, and when we leave it, and is our confidential friend from the cradle to the grave. We consult him, confide in him, trust him, though he often has to tell us disagreeable truths. There are few of us who have not reason to be deeply grateful for his knowledge, tender care, and patient watchfulness, by which we have been brought through a severe and dangerous illness. Certainly I myself can speak feelingly as one of that number. But I go further: for over and above our individual thanks, you will, I know, agree that our medical profession has earned the heartfelt gratitude of the whole nation; for, thanks to the marvellous progress in medicine and surgery, and individual knowledge and skill, the life of our beloved sovereign was, under the blessing of God, preserved to us during the past year."

This was a reference to the illness of King Edward, which delayed his coronation. The Prince continued:

> "We must also remember, in estimating the splendid work accomplished by our hospitals, that nine-tenths of the medical advice—and this is certainly the best in the country—is given practically gratuitously. The debt to the doctor is not merely one which is to be considered as discharged as soon as his bill for professional service has been paid. There remains the sense of gratitude, which, I am glad to say, often not only finds expression in a sincere and lasting friendship between doctor and patient, but in thank-offerings by which this institution with other medical charities has materially benefited."

The Prince went on to contest the popular idea that doctors were rich men. The wealthy members of the profession, he said, might perhaps be counted on the fingers, and among those few large generosity was shown to their necessitous brethren. Some medical men were able to make a fair income and perhaps to save money, but too many were underpaid and struggled in an overstocked market. Too many succumbed to a hard life of exposure by which their

* The form in which the toast of "His Majesty" is given at the dinners of London University schools.

constitutions were undermined, or to the dangers of infection, and he proceeded to quote from the benevolent side of the work at Epsom some hard cases. No wonder that the late Lord Rosebery, in following the royal speaker, said that he would challenge any orator, however practised, to vie with the eloquent and, what is more, the true terms in which the Prince had spoken of the medical profession.

### The King and the British Medical Association

It was shortly after this speech, perhaps in consequence of it, that the Prince of Wales was asked to accept Honorary Membership of the British Medical Association. At the Annual Meeting held at Swansea in 1903, the President, Dr. T. D. Griffiths, said that the Prince's election was not desired only on account of the honour which his name on its roll would bring to the Association, but because of the distinguished services he had already rendered to the medical profession. Like his illustrious father, Dr. Griffiths continued, he had invariably shown great solicitude for the welfare of the community, and had recognized by his actions the importance of hygiene and public health. The resolution was seconded by the Chairman of Council, Mr. Andrew Clark, and unanimously carried. The Prince replied by telegram on the same day that he felt very proud to have been elected an Honorary Member, and he wished the British Medical Association all prosperity. It is recorded that when the resolution was passed at the Annual Meeting the members rose and sang "God Bless the Prince of Wales."

Some time afterwards the Prince received personally at the hands of the Chairman of Council the certificate of Honorary Membership illuminated and inscribed on vellum. The presentation had been deferred because it was hoped that at the following Annual Meeting, held at Oxford in 1904, the Prince himself might be present, but his engagements prevented this, and therefore the presentation took place at Marlborough House. In accepting the certificate the Prince showed much interest in the work of the Association, and made several inquiries as to its scientific activities.

At the Annual Meeting in 1910, following his accession to the Throne, a communication was read from the King consenting to become Patron, an announcement received with great satisfaction. He remained Patron throughout his reign. On the occasion of the Silver Jubilee a Loyal Address was presented, bearing the signatures of the President and other officers of the Association, and a reply was received stating how deeply His Majesty appreciated the sentiments of loyalty and affection.

### Opening of the Association House

The outstanding event in the relations of the Association to its royal Patron was the opening by the King of the new House of the Association in Tavistock Square. This took place on Monday, July 13th, 1925. The King was accompanied by the Queen, and the ceremony brought together one of the most representative gatherings ever held in the name of British medicine. An address was presented to the King by Doctor (now Sir Robert) Bolam, the Chairman of Council, and in reply His Majesty, after a reference to the admirable design of the building, spoke as follows:

> "Since its foundation, nearly a century ago, by Sir Charles Hastings, your Association has shown a remarkable increase both in membership and usefulness; and the well-informed and constructive criticism that it brings to bear upon the evolution of your profession is of great value. The Medical Acts wisely restrict admission to the *Medical Register* to those who have been trained in accordance with prescribed regulations and have passed the necessary qualifying examinations. At the same time vigilance must always be exercised in order that your profession may keep abreast with the advance of science and also preserve a high standard of professional practice and ethics. The noble purpose, the character, and the skill of those engaged in the art of healing are your most precious traditions, and you do well jealously to watch over such attributes. . . .
>
> "The reference in your address to the ever-widening scope of the medical practitioner in relation to the general health of the people is most satisfactory, and I have followed with sympathy the negotiations for securing smooth and effective co-operation between him and the public medical services. The welfare of my people at home and throughout the Empire largely depends upon an efficient and well-organized health administration. The protection of maternity, the care of the child, a sanitary home and workshop, the safeguarding of the food supply, properly designed defences against infection and prevalent disease, are all matters of vital importance. There is also an opportunity for the medical practitioner in his everyday practice to be a missionary and teacher of public hygiene and of personal health."

The speech concluded with an allusion to the Queen's interest in the education and work of medical women and an appreciation of their activities in all branches of medicine.

### A Master of Detail

Those who had the opportunity of following in the train of the royal party after the ceremony in the Great Hall received a vivid impression of the King's great interest in detail. He took particular note of the Association's Roll of Honour and asked many questions on the subject. A number of the more valuable books in the Library engaged his attention, and he was also interested in some zoological curiosities and other specimens from the Museum of the Royal College of Surgeons.

This interest in detail, which never appeared to flag, was one of the outstanding characteristics of the dead King. Royal persons have a burden to bear from which humbler folk are exempt in that they are expected to look interested on all occasions. Cicero was wrong in saying that kings do not trouble about trifles. In the case of King George care for detail was part of his character. On the recent occasion already mentioned when he opened the Post-Graduate School, although evidently fatigued with the events of the Jubilee, he was not content to say a few words to the assembled company and withdraw, but he made a thorough tour of the institution and the adjoining hospital, once again astonishing some of the members of the staff by his minute and accurate acquaintance with all the details of modern hospital management. To many people, however benevolently inclined, hospitals are a dull subject, but King George, had he been of another station,

would have made an admirable house-governor. Many years ago he remarked that he had visited something like one hundred hospitals, and began to feel himself something of an expert. Sir George Turner, in his *Unorthodox Reminiscences*, mentions the interest the King took in naval hospitals during the war. Once, speaking to a company of admirals, Sir George ventured to remark that what the highest admiral of all did not know about hospitals was not worth knowing. Hospitals seemed to have a magnetism for him. Quite early in his career, when visiting India in 1901, he interrupted the schedule at Calcutta to visit a general hospital under the guidance of Sir Havelock Charles. Nothing in this field, at any rate, was too tiresome for his attention, whether during his ten years as Heir Apparent or his twenty-five years as King.

### Interest in Hospitals

It would be hopeless to attempt a complete list of the hospital activities in which King George took part. As early as 1897 he became President of King Edward's Hospital Fund. In 1901 he was installed as President of St. Bartholomew's in succession to King Edward. On revisiting St. Bartholomew's six years later to open the new out-patient and casualty block he referred to this great City hospital as an institution with which throughout its very long history the reigning monarch or some member of his family had been always associated. Another hospital presidency to which quite early he succeeded was that of Guy's (of which King Edward VIII is now President). On attending a ceremony at St. Mary's Hospital in 1933 he remarked that he felt a special interest in revisiting it, because for nearly twenty years he was its President. He also remembered this hospital gratefully because many years previously the skill and care of a nurse from St. Mary's contributed largely to his recovery from an attack of typhoid fever (an allusion to an illness of 1891). On this occasion he referred to the happy circumstance that curative and preventive medicine were not standing still, but that the tireless efforts of devoted workers in the clinical sphere and in the laboratory were ever adding to existing knowledge, and no less important than the growth of knowledge was its dissemination to those who would apply it.

The war placed a tremendous strain upon the King, and his itinerary would have taxed the energies of men of half his years. In one West of England progress, for instance, he visited on successive days large military hospitals at Bristol, Exeter, Plymouth, and Torquay. On his visits to the front he took care always to see any military hospital and casualty clearing station within reach. Recording his impressions of one large casualty clearing station, he said that the patient cheerfulness of the wounded was only equalled by the care and gentleness of those ministering to their wants. "Of the hospitals," he said on another occasion, "their efficiency and skill, and the untiring efforts of the staff I cannot speak in too high praise." The aftermath of the war in the shape of the disabled was very near to his heart. His silver wedding happened to fall in the last months of the war, and the City of London gave him £53,000, which sum, with a further £25,000 from his own purse, he handed over to the King's Fund for the Disabled.

The "King's Speech" to Parliament is well known to be the production of his Ministers. Nevertheless, the long speech which King George made to the first Parliament assembling after the war must have given him great pleasure to deliver, proposing as it did to repair war wastage, to improve the nation's health, and to raise the standard of living throughout the community. The same speech announced a Bill for the creation of the Ministry of Health.

Cancer research enlisted the King's earnest interest. One of the questions he asked when he accepted Honorary Membership of the British Medical Association was whether the Association was undertaking any special investigation in this subject. In 1928 he received at Buckingham Palace the delegates to the international conference arranged by the British Empire Cancer Campaign, and mentioned that as President for several years of the Cancer Research Association he knew the value of such work. In the same year he received a number of those taking part in the Harvey tercentenary celebrations, and said that William Harvey, in his threefold capacity as private physician, physician to St. Bartholomew's, and an eminent student and investigator, foreshadowed what was now and had long been characteristic of British medicine—the combination of research with medical and surgical practice allied with a generous devotion to the service of the poor in public hospitals. The King was elected an Honorary Fellow of the Royal College of Surgeons of England in 1909, and an Honorary Fellow of the Royal Society of Medicine on its centenary in 1905, becoming Patron of that body on his accession; in 1912, accompanied by the Queen, he opened the new house of the Royal Society of Medicine in Wimpole Street.

### The King's Illnesses

On many occasions in public the King referred to the services which he himself had received from his doctors. As already mentioned, in 1891, just before the death of his brother, the Duke of Clarence, Prince George had an attack of typhoid fever, from which he recovered after six weeks. Apart from a slight operation in 1905, he was free from serious illness until 1915, when, during a visit to St. Omer, he was thrown by his horse and sustained severe bruising and much muscular stiffness, though no visceral injury. On this occasion he was attended by the same nurse as during his typhoid attack.

But the King's illness which brought the whole nation and Empire to his bedside was that which started in 1928. It began towards the end of November with symptoms of what in homely speech is called a feverish cold, but soon manifested itself as a streptococcal blood infection. Definite signs of congestion appeared in one lung, with some pleurisy, and the length of the infection as well as its severity contributed to the strain on the heart of a patient aged 63. During the early weeks of the illness medical bulletins of commendable frankness were issued twice or thrice daily, and authoritative reports appeared at frequent intervals in the *British Medical Journal* and the *Lancet*. Early in December an empyema was evacuated by rib resection at Buckingham Palace.

The medical care of His Majesty was in the hands of a team consisting of the following, who contributed

in their various ways: Lord Dawson of Penn, Sir Stanley Hewett, Sir Humphry Rolleston, Sir Hugh Rigby, Sir Farquhar Buzzard, Mr. Wilfred Trotter, Sir Francis Shipway, Dr. L. E. H. Whitby, Dr. H. K. Graham Hodgson, Sir Robert Stanton Woods, Dr. F. D. Howitt, and Professor E. C. Dodds. The public was warned that progress could only be slow, and that anxiety must continue. Meanwhile the illness of the King cast a shadow over every home in the land. A tone of guarded hopefulness began to appear in the bulletins towards the end of December, and in the early days of 1929 a slight but not negligible improvement in the King's condition began to be noted, and in the second week of February he was sufficiently improved to be taken by ambulance to the Sussex coast. Satisfactory progress continued, and in April the King himself addressed a message to his people which caused universal gratification. He did not forget once again to utter words of gratitude for "the wonderful care and devotion" of the medical men and nurses whose care had brought him back from danger. Some set-back was announced at the end of May, when a residual abscess formed on the right side of the chest, but it did not give rise to anxiety, since the trouble had a local origin. On July 7th a thanksgiving service was held in Westminster Abbey. Two days later, as a result of a consultation between those in medical charge of the patient, it was decided that a further operation on the King was necessary to provide adequate drainage for the superficial abscess, and this operation also was performed by Sir Hugh Rigby and Mr. Wilfred Trotter. The rest of the history was uneventful, and apart from an attack of subacute bronchitis in the spring of 1931, His Majesty remained in fair health until the fatal illness developed a week ago.

# THE KING'S LAST ILLNESS

King George attained the age of 70 on June 3rd last, during the Silver Jubilee celebrations. Apart from a short attack of bronchial catarrh towards the close of that month he seemed to be keeping his health remarkably well. With the Queen, His Majesty left London for Sandringham on December 21st, and he broadcast his message to the Empire from there on Christmas Day.

### The Bulletins

Late on Friday, January 17th, it became known that the King was confined to his room with a cold, and the following bulletin, issued that night from Sandringham, was published in all the newspapers on Saturday morning:

> "The bronchial catarrh from which His Majesty the King is suffering is not severe, but there have appeared signs of cardiac weakness which must be regarded with some disquiet."

This was signed by Sir Frederic Willans, Surgeon-Apothecary to H.M. Household at Sandringham; Sir Stanley Hewett, Surgeon-Apothecary to His Majesty; and Lord Dawson of Penn, Physician-in-Ordinary. On Saturday at 10.15 a.m. the following appeared over the same three signatures:

> "The anxiety expressed in the bulletin of last night persists."

At 3.30 p.m. on Saturday the following bulletin, signed also by Sir Maurice Cassidy, Physician-Extraordinary to the King, was issued:

> "His Majesty the King has had some hours of restful sleep. The cardiac weakness and the embarrassment of the circulation have slightly increased and give cause for anxiety."

At 10 o'clock that evening, after Sir Maurice Cassidy had returned to London, it was officially announced that there was no change to report. On Sunday, January 19th, at 11 a.m., the following bulletin was issued:

> "In spite of a restless night, His Majesty the King has maintained strength."

That evening at 7.15 it was announced that His Majesty had passed a quiet day, and there was no change in his condition.

The bulletins issued from Sandringham House on Monday, January 20th, were as follows:

> 10.45 a.m. "The King has had a more restful night. There is no substantial change to record in His Majesty's condition."
>
> 5.30 p.m. "The condition of His Majesty the King shows diminishing strength."
>
> 9.25 p.m. "The King's life is moving peacefully towards its close."

Soon after midnight the following official bulletin announced the end:

> "Death came peacefully to the King at 11.55 p.m. to-night in the presence of Her Majesty the Queen, the Prince of Wales, the Duke of York, the Princess Royal, and the Duke and Duchess of Kent."

### Some Medical Details

The following brief statement, giving some medical details, is based on authority:

Though it is understood that for some weeks His Majesty's health had not been altogether satisfactory the King was able to go out, and in fact rode on his pony for a short time on Wednesday, January 15th. On Thursday, January 16th, the King showed signs of a mild catarrh, which soon began to abate.

The "disquiet" expressed on Friday and Saturday arose from evidences of cardiac insufficiency. The margin of cardiac reserve had in recent days been narrowing. This illness therefore arose from within, and was in the nature of a culmination. It was thus not comparable to the invading streptococcal septicaemia localizing at the base of the right lung from which King George suffered seven years ago. That illness inevitably placed heavy burdens on the heart, and therefore may have had a causal relationship to this last illness. It is a remarkable achievement for King George to have recovered from septicaemia and to have reigned over his Empire for seven years through times which have been eventful and sometimes anxious.

This last brief chapter of the King's life showed that the body carried through its work till its powers were ended and then came to rest after an illness short and peaceful in its close.

## TO THE KING'S MOST EXCELLENT MAJESTY

*The Humble Address of the President and Members of the British Medical Association*

MAY IT PLEASE YOUR MAJESTY,

We, Your Majesty's dutiful and loyal subjects, the members of the British Medical Association, distributed throughout Your Majesty's Empire, beg leave to express our respectful and heartfelt sorrow at the heavy affliction that has fallen upon Your Majesty, The Queen Mother, and the other Members of The Royal Family, by the death of our beloved Sovereign King George, Patron of the Association.

We humbly tender to Your Majesty congratulations upon Your Accession to the Throne, and earnestly pray that Your Majesty's Reign may be long and illustrious and blest with peace.

Signed on behalf of the British Medical Association,

HUMPHRY ROLLESTON,
*President (Acting).*

E. KAYE LE FLEMING,
*Chairman of Council.*

H. S. SOUTTAR,
*Chairman of Representative Body.*

N. BISHOP HARMAN,
*Treasurer.*

G. C. ANDERSON,
*Medical Secretary.*

## Universities and Colleges

### UNIVERSITY OF LONDON

The contemplated special service in St. Paul's in connexion with the celebration of the centenary of the University has been arranged for Wednesday, July 1st, at 11.30 a.m., when the Archbishop of Canterbury will preach the sermon.

### NATIONAL UNIVERSITY OF IRELAND

At a meeting of the Senate on January 16th, with the Pro-Vice-Chancellor, Dr. Denis J. Coffey, in the chair, the reports of the examiners upon the medical and dental examinations, December, 1935, were considered, and passes, honours, etc., awarded.

## The Services

### DEATHS IN THE SERVICES

Lieut.-Colonel Augustus Hewett, R.A.M.C. (retired), died at Hampton Hill on December 27th, 1935, aged 82. He was born at Ahmedabad, in the Bombay Presidency, on December 9th, 1853, and was educated at Bart's, taking the M.R.C.S. and L.S.A. in 1876, and subsequently the F.R.C.S.Ed. in 1889. After acting as house-surgeon of the Western Branch of the Brighton and Hove Infirmary, he entered the Army as surgeon on February 4th, 1877. He resigned on August 31st, 1878, but was reappointed on March 6th, 1880. He attained the rank of lieutenant-colonel on March 6th, 1900, and retired on October 17th, 1903.

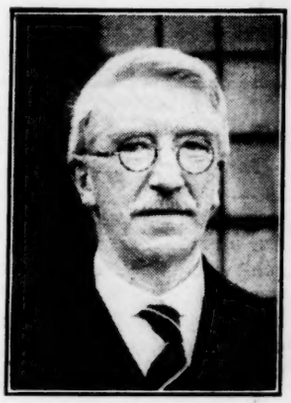
## Obituary

### A. FRANCIS DIXON, Sc.D., M.B.

Professor of Anatomy, University of Dublin

The death occurred on January 15th of Andrew Francis Dixon, professor of human anatomy and embryology in the University of Dublin. Born in 1868, he came of a well-known Dublin family. One of his brothers occupies the chair of botany in Dublin University, and another, until lately, was professor of civil engineering in the Imperial College of Science and Technology, London, while his uncle, R. V. Dixon, was a Fellow of Trinity College.

He entered Dublin University in 1885 and had a brilliant academic career, gaining a senior moderatorship and a gold medal in natural science and securing many other distinctions in the course of obtaining his medical degree. It was as a medical student that he first came in contact with the late Professor D. J. Cunningham, who so greatly influenced his career. His early interests were in zoology, and his first publications were concerned with the marine invertebrates. But in 1893 his attention was turned more definitely towards human anatomy, and he went to Leipzig to study under the late Professor His. A year later he was appointed chief demonstrator in anatomy in Trinity College, Dublin, under Cunningham. In 1897 he was appointed professor of anatomy at University College, Cardiff, then in 1903 he returned to his old college to succeed Cunningham as professor of anatomy and chirurgery, and from that date he devoted himself wholeheartedly to the service of Trinity College. In 1916 he became its representative on the General Medical Council, in 1922 he was appointed to the newly founded chair of human anatomy and embryology, and in 1924 he became dean of the faculty of physic. But perhaps his greatest work was done in the interests of students, and especially in their early post-graduate years. He was keenly interested in all their activities, and took a very large part in organizing the Trinity College Association, with the object of keeping them in touch with each other and with their college. He was also actively interested in the old O.T.C. and in the Dublin University Biological Association, of which society he was president in 1904–5.



Outside the university Professor Dixon had a wide circle of friends and interests. He was a lifelong member of the Anatomical Society of Great Britain and Ireland, and was elected president of that society in 1934. From 1917 to 1925 he was a member of the Council of the Royal Dublin Society, and in the latter year was appointed a governor of the society. On six separate occasions he was elected a member of the Council of the Royal Irish Academy, and in 1919, and again in 1926–7, he was a vice-president. For thirty years he was a member of the Council of the Royal Zoological Society of Ireland, and from 1927 to 1931 held the office of president. He was a Fellow of the Royal Academy of Medicine in Ireland, and in 1906–8 president of the Section of Anatomy and Physiology. In 1934 he was appointed warden of Alexandra College. He had been a member of the British Medical Association for many years, and at the Annual Meeting in 1899, and again in 1909, he was a vice-president of the

Section of Anatomy and Physiology. His many personal friendships and his wide sympathies made him a valuable link between the university and outside bodies.

In his younger days Dixon published many interesting contributions to anatomical science. Our knowledge of the development of the fifth cranial nerve, of the course of the taste fibres, and of the special supports of the uterus in the female pelvis has been considerably extended by his researches. But in later years pressure of administrative duties and heavy responsibilities in directing the medical school necessarily curtailed his time for such work. But those who knew him realized that he possessed an amazing fund of original observations and accurate knowledge on many interesting points, and regretted that lack of time, and his own modesty, prevented him from committing them to print.

He will be remembered chiefly as a loyal and warm-hearted friend. His memory for faces was extraordinary, and Trinity men revisiting the college after a lapse of many years were always sure of a warm personal welcome from the dean. For the college itself he entertained such loyal devotion that no task was either too large or too menial for him to undertake if he felt that its interests were concerned. C. P. M.

Professor T. G. MOORHEAD writes:

There has passed away in the person of Professor Andrew Francis Dixon a man who in his whole life embodied all the most noble and chivalrous traditions of his profession. As an anatomist and man of science Dixon rapidly achieved a high reputation. A keen lover of nature, he was all his life a student of natural science, and regarded human anatomy as a branch of that science. This wide outlook enabled him to impart a vivid interest to the most minute details of his subject.

When he returned to Trinity College as Professor of Anatomy in 1903 he at once threw himself into the life of the university, and was largely responsible for bringing about some much-needed reforms. It was mainly owing to his initiative and tact that a change was made in the governing body of the College, whereby representatives of the Junior Fellows and Professors became members of the Board. He and the late Professor John Joly were the two first representatives of the Professors to sit on the new Board. As a lecturer he was unsurpassed. He not only held the attention of all his listeners, but was able to convey his information in such a manner that it remained fixed in the memory for all time. I remember, almost word for word, lectures which I heard him deliver just forty years ago. But it will be the man rather than the anatomist who will be remembered by many generations of students. To all students he was an inspiration, and many of them gained their first stimulation to work from his boundless enthusiasm. His influence over them was immense, and by all of them he was affectionately known as "Andy Frank." It may be stated without exaggeration that he was the best dean that any medical school ever possessed or ever will possess. He was absolutely single-minded in his devotion to the interests of the school. He was the most unselfish of men, and, although devoid of personal ambition, he was most ambitious for the welfare and success of everything that concerned Trinity College. Every student who entered the school became from the moment of his entry a personal charge of Dixon's, and from that moment his career was followed with intense interest. If a man was not working he was sent for and quietly talked to and encouraged. Nothing pained him more than to see a man fail in his examinations from laziness or any other cause. Possessed of lofty ideals, temperate and simple in his tastes, he preached by his example the doctrine of hard work and simple living.

His knowledge of medical education and of the details of medical curricula was profound. He was always studying to improve our own curriculum. No detail escaped his attention. There is not the least doubt that it is largely to his fostering care that the medical school owes its present great prestige. He never sought publicity, but, on the other hand, he never shirked any public duty. All his work was characterized by great thoroughness; he believed in taking pains, and was impatient of careless and slovenly habits. His influence in the College was by no means confined to the students; he was universally liked, and his advice was sought on many matters by Fellows and Professors, and was always freely given. His loss is a severe blow to the medical school. He added new dignity to the office of dean of the faculty of physic, and has left behind him a tradition of service which will endure as long as the school itself.

[The photograph reproduced is by the Irish Times Ltd.]

## Medical Notes in Parliament

[FROM OUR PARLIAMENTARY CORRESPONDENT]

Both Houses of Parliament assembled on January 21st to swear allegiance to King Edward. It was arranged that an address to the King should be moved in the House of Commons by Mr. Baldwin on January 23rd, and that both Houses that day should attend in Westminster Hall, when the body of King George was brought there.

No other Parliamentary business is likely before February 4th, the date originally named for the reassembly.

# Medical News

The funeral of His late Majesty King George V has been fixed for Tuesday, January 28th, on which day the House of the British Medical Association in Tavistock Square will be closed. Readers are asked to note that all editorial communications and advertisements intended for the issue of February 1st should reach the Editor and the Financial Secretary and Business Manager respectively by the first post on Monday, January 27th.

Dr. H. Batty Shaw will give an address on "The Medical Examination of Proposers for Life Assurance" before the University College Hospital Medical Society, Gower Street, W.C., on Thursday, January 30th, at 5 p.m.

A series of lectures, free to all medical practitioners and senior students without ticket, will be delivered at the National Hospital for Diseases of the Heart, Westmoreland Street, W., on Tuesdays at 5.30 p.m., from February 4th to April 28th (except April 14th). Details will be published in the diary column of the *Supplement* week by week.

The North-West London Medical Society has arranged the following lectures, to be given at the Regal cinema, Finchley Road, N.W.: February 11th, Dr. Russell J. Reynolds, "Cineradiography"; March 10th, Dr. John Freeman, "Immunology in General Practice"; and May 12th, Dr. W. E. Gye, "Recent Advances in Cancer Research." On April 14th a visit will be paid to the Royal Veterinary College and Veterinary Research Laboratories at the invitation of Sir Frederick Hobday, who will give an address.

The fifth Horsley Memorial Lecture, which was delivered by Sir Walter Langdon-Brown at University College Hospital Medical School, has now been published in full by the Cambridge University Press under the title *The Integration of the Endocrine System* (price 2s.). A report of this lecture was printed in the *British Medical Journal* of November 30th, 1935, p. 1061.

Professor J. S. Haldane, M.D., F.R.S., will speak on "The Ventilation of the Mersey and other Tunnels," at a general meeting of the Institution of Heating and Ventilating Engineers at the London School of Hygiene and Tropical Medicine, Keppel Street, W.C., on Wednesday, February 12th, at 2.30 p.m.

Major-General W. P. MacArthur, D.S.O., Commandant and Director of Studies at the Royal Army Medical College, will deliver a lecture on "The Romance of Preventive Medicine," at the Royal United Service Institution, Whitehall, S.W., on Wednesday, February 12th, at 3 p.m.

A meeting of the Fever Hospital Medical Service Group of the Society of Medical Officers of Health will be held at 1, Thornhaugh Street, Russell Square, W.C., on Friday, January 31st, at 4 p.m., when papers on "The Serum Treatment of Typhoid Fever" will be read by Dr. A. Felix and Dr. C. J. McSweeney.

Dr. Walter Pagel will give a demonstration on experimental production of early pulmonary tuberculosis at the Sims Woodhead Memorial Laboratory, Papworth Village Settlement, on Saturday, February 15th, at 3 p.m. All who are interested and wish to attend should communicate with Dr. Pagel at Papworth Hall, Cambridge.

The Fellowship of Medicine announces that surgical tutorial classes will be given at the National Temperance Hospital at 8.30 p.m.: on January 28th, neck; January 30th, skull and brain; February 4th, intestinal obstruction; February 6th, thorax. Other advanced courses include proctology, at St. Mark's Hospital, February 3rd to 8th; chest diseases, at Brompton Hospital, February 10th to 15th; gynaecology at Chelsea Hospital for Women, February 10th to 22nd; primary F.R.C.S. lecture-demonstrations in anatomy and physiology, at Infants Hospital, on Mondays, Wednesdays and Fridays, at 8 p.m., February 24th to April 24th; and M.R.C.P. clinical classes, at National Temperance Hospital, on Tuesdays and Thursdays, at 8 p.m., February 25th to March 12th. Courses particularly designed for general practitioners include neurology, at West End Hospital for Nervous Diseases, February 3rd to 8th, and the following week-end courses: physical medicine, at St. John Clinic and Institute of Physical Medicine, February 8th and 9th; children's diseases, at Princess Elizabeth of York Hospital, February 22nd and 23rd; and chest diseases, at Brompton Hospital, March 7th and 8th. Full particulars may be obtained from the Fellowship of Medicine, 1, Wimpole Street, W.1.

A lecture on the theory and practice of contraception will be given at the Walworth Women's Welfare Centre (153A, East Street, S.E.17) by Dr. Gladys Cox on Friday, February 7th, at 6 p.m. A demonstration will follow the lecture, and both are open to students who have completed their gynaecological course and to medical practitioners. Tickets (5s.) should be applied for in advance, and those attending are asked to bring rubber gloves.

The sixth annual congress of the Medical Societies of North Africa will be held from April 3rd to 5th at Rabat and Casablanca, when the subject for discussion will be amoebiasis in North Africa. Further information can be obtained from Dr. Fournier, 26, Boulevard du 4e Zouaves, Casablanca, Morocco.

There will be two plenary sessions of the thirtieth South African Medical Congress, which, as already announced in the *Journal* (December 14th, 1935, p. 1161), will be held at Pietermaritzburg from June 29th to July 30th. The subject for discussion at the first session on the mornings of June 30th and July 1st will be "Abortion: Its Legal and Medical Aspects," and at the second session, on July 2nd, the subject will be "Should the Practitioner Operate." Members who think of attending the congress should communicate with the Medical Secretary, B.M.A. House, Tavistock Square, London, W.C.1, or with the honorary organizing secretary, Dr. C. C. P. Anning, P.O. Box 285, Pietermaritzburg, South Africa.

Dr. L. Haden Guest, secretary of the Leverhulme Research Fellowships, announces that applications are invited for fellowships or grants in aid of research. They are intended for senior workers who are prevented from carrying out research by routine duties or pressure of other work. Any subject which may add to human knowledge may be proposed for a fellowship, but preference is given to subjects in which other provision for research is inadequate. The amount granted will depend on the nature of the research and the circumstances of the applicant. Forms of application, returnable by March 1st at latest, may be had from Dr. Haden Guest, Union House, St. Martins-le-Grand, E.C.1.

The nineteenth session of the French Assembly of General Medicine was held at the Hôtel Dieu, Paris, under the chairmanship of Dr. Georges Duhamel of the French Academy on January 5th, when a discussion took place on the intellectual and professional orientation of the child of school age. Addresses were delivered by Professor Carnot, the president; Dr. Godlewski, the general secretary; and Dr. Duhamel.

The issue of the *Journal of Pathology and Bacteriology* for January is dedicated to Professor Ludwig Aschoff of Freiburg on the occasion of his seventieth birthday.

The following medical promotions in, and appointments to, the Venerable Order of the Hospital of St. John of Jerusalem were announced in the *London Gazette* of January 3rd: as Commanders, James Cairns, C.I.E., O.B.E., Lieutenant-General Sir James A. Hartigan, K.C.B., C.M.G., D.S.O.; as Officers, Dr. N. M. Goodman, Major C. G. H. Morse, Major R. F. Walker, *M.C.*, R.A.M.C., Dr. A. Tetreault, Lieut.-Colonel J. N. Gunn, D.S.O., Dr. Constance E. M. Berridge; as Serving Brothers, Dr. A. Sprott, Dr. M. Barseghian, Dr. J. A. Adams, Dr. T. H. Irvine, Dr. T. H. Goddard, Dr. G. D. E. Tullis, Mr. H. P. Milligan, Dr. R. C. Lowther; as Associate Serving Brother, Dr. R. Wolff.

In the Calcutta Criminal Court, on February 16th, 1935, two of the four men charged with conspiracy to murder a rich Indian landowner, by injecting him with plague bacilli from a research laboratory, were found guilty and sentenced to death. They are Benayendra Nath Pandey, step-brother of the murdered man, and Dr. Taranath Bhattacharya. The two other accused persons, Dr. D. R. Dhar and Dr. S. P. Bhattacharya, were acquitted. The High Court of Appeal at Calcutta has now commuted the death sentences to transportation for life.

Dr. Max Nonne, professor of neurology at Hamburg University from 1925 to 1933, and author of a book on syphilis of the nervous system, of which five editions have appeared, and of numerous other neurological works, celebrated his seventy-fifth birthday on January 13th.

The French Society of Anaesthesia and Analgesia, 12 Rue de Seine, Paris, offers a prize of 2,000 francs for the best work on anaesthesia or analgesia, which should be sent in before March 31st.

Herr Hitler has put at the service of the Allgemeine Institut gegen die Geschwulstkrankheiten of the Rudolf Virchow Hospital in Berlin an annual revenue of 50,000 Reichsmarks for cancer research.

One of the four Parliamentary candidates at the by-election in the Ross and Cromarty Division is Dr. W. S. Russell Thomas, who unsuccessfully contested the Aberdeen and Kincardine (Central) Division at the General Election on November 14th, 1935. Dr. Russell Thomas is standing as an Independent Liberal.

The Secretary of State for Scotland has appointed Dr. Francis Sutherland and Dr. Laura Margaret Dorothea Mill to be Deputy Commissioners of the General Board of Control for Scotland.

Professor Nicola Pende, director of the medical clinic at Genoa, has been nominated professor of medical pathology in the New University Institute at Rome.

Geh. Med.-Rat Professor E. Lexer has been elected president of the German Society of Surgery for 1936.

Owing to unforeseen circumstances the sixth congress of the International Society for Urology at Vienna has been postponed from June 6th to 12th to September 9th to 12th.

# Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to **The EDITOR, British Medical Journal, B.M.A. House, Tavistock Square, W.C.1.**

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone, unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

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## QUERIES AND ANSWERS

### Treatment of Dipsomania

Dr. G. M. TORRANCE (Staffordshire) writes: In reply to "M.D." (*Journal*, January 18th, p. 142), I would like to suggest that, unless his dipsomaniac is willing and anxious to undergo treatment in order to be cured, all efforts will be unavailing. I would further suggest that institutional treatment is highly desirable. Any misapprehension regarding an institution could be allayed by reading W. Seabrook's *Asylum*, which is a true and encouraging statement of fact.

### Income Tax

*Assistant M.O.H.—Expenses*

"P. W." is in the Government service and receives a salary of £500 a year. Can he deduct as expenses (*a*) professional subscriptions, (*b*) fees for examination course and for the examination itself, and (*c*) the excess of the cost (including depreciation) of his car over the amount received on a basis of 1½d. per mile?

*** (*a*) Only if membership of the societies in question is required as a condition of his appointment. (*b*) No. They represent capital outlay incurred to improve his professional ability and prospects. (*c*) He is legally entitled to the deduction of the excess of the amount expended "wholly, exclusively, and necessarily in the performance of the duties of his office" over the amount received, but as this amounts to having to prove that the allowance is insufficient it is in practice seldom, if ever, that such a claim succeeds.

*Disposition in favour of child*

"W." refers to a note in the *Journal* of October 19th last, and inquires how he would benefit by making a voluntary disposition in favour of his child, aged 3. The only income of the child is the interest on a small Post Office account. For 1935-6 "W." will pay tax on the sum of £293.

*** If "W." enters into a legally binding agreement to pay, say, £45 per annum to trustees for the benefit of his child he can deduct tax at the standard rate from the £45, and can then reclaim the tax from the Revenue as the natural guardian of the child. It is essential that "W." should have no power of revocation of the deed without the consent of some one other than his wife or himself. Further, the grant of the income to the child must be expressed to be for the life of the child. The cost to "W." (apart from preparation of the necessary deed and stamp) will be represented by the loss of the earned income relief on £45—that income having been made legally the income of the child it ceases to be the earned income of "W."

## LETTERS, NOTES, ETC.

### Drug Habit, Anaesthesia, and High Blood Pressure

Lieut.-Colonel HENRY SMITH, C.I.E., I.M.S.(ret.), writes: With reference to your annotation on hypertension in the *Journal* of January 18th (p. 118) a few clinical facts not commonly known might be of interest to those investigating this subject from the experimental point of view. A drug habit once established is never lost, however long the habitué totally abstains from his drug. I early learned that the easy method of chloroforming a chronic liquor drinker is to give him a dose of whisky sufficient to make him "jolly" an hour before anaesthetization, after which he takes chloroform as easily and smoothly as a baby, and requires very little of it. I have had exactly similar experiences with opium eaters after long years of total abstinence from the drug. The habit for these drugs, and I presume others too, once acquired, seems in this respect to be never lost. With regard to high blood pressure, a fact which I think is hardly appreciated by the profession is that nux vomica eating is very prevalent in India, and that those addicted to it are frequently the subjects of cerebral haemorrhage at and under the age of 40. They have gone through the whole gamut of high blood pressure. They are well-to-do and indulge in sexual excess to such a degree that their sexual powers begin to flag very early in life, and hence the habit. Nux vomica raises the blood pressure, and when taken regularly establishes the blood pressure habit. A *pressor* endocrine poured in very small quantity into the blood for some time in excess of normal could, on the principle of the drugs above noted, establish a state of hypertension, even though after a few years no excess is to be found in the blood.

### Calcium Sulphide in Septic Conditions

Dr. W. LEES TEMPLETON (London, N.7) writes: The use of calcium sulphide in the prophylaxis and treatment of sepsis in the puerperium as reported in the *Journal* of November 30th is interesting, in view of the fact that this drug, as "hepar sulph.," is a well-known and useful drug in the homoeopathic materia medica, and is, of course, frequently indicated in septic but most often, in our experience, in staphylococcal rather than in streptococcal infections. It is of further interest also that it has been shown by measurement of the opsonic index to raise the resistance of the healthy to staphylococci when given in small doses, and to lower the resistance if given in larger doses. This was confirmed independently of laboratory findings by the famous Dr. Ringer, who claimed that the drug when given in small doses tended to check suppuration, and when given in larger doses to encourage it.

### A Warning

A man who has been obtaining money under false pretences from medical practitioners in London is wanted by the Criminal Investigation Departments of Marylebone Lane Police Station (Welbeck 2824) and Bow Street Police Station (Temple Bar 6400). His usual technique is to claim acquaintanceship, either with the practitioner himself or with a friend whom he names, and then he explains that he is in town with his wife but has unfortunately forgotten to take sufficient ready cash with him. He then asks for a loan of one pound or two pounds. He is described by various names and various military titles. His age is 63, height 5 ft. 8½ in., grey eyes, white hair, white waxed military moustache, complexion ruddy and bloated, and he is of a stiff build and military appearance. He was last seen wearing a dark overcoat, bowler hat, spats, and a bow tie, and he occasionally affects a small imperial beard. He is very plausible, and usually speaks of his old school. Should any of our readers receive a visit from this person they would be well advised to detain him under some pretext and inform the police.

### Corrigendum

Messrs. H. K. Lewis and Co. Ltd. ask us to state that the authors of the *Guide to Human Parasitology* (reviewed in our issue of January 18th, p. 114) should have been given as BLACKLOCK and SOUTHWELL, and not Blackwell as printed. Also the price is 12s. 6d., not 13s. 6d.

### Vacancies

Notifications of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 48, 49, 50, 51, 52, 53, and 56 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 54 and 55.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page 40.